DOCUMENT RESUME

ED 121 644 SO 008 990

AUTHOR	Earle, Ralph B., Jr., Ed.
TITLE	PSI and Political Science: Using the Personalized System of Instruction to Teach American Politics. Instructional Resource Monograph, No. 2.
INSTITUTION	American Political Science Association, Washington, D.C.
SPONS AGENCY	National Science Foundation, Washington, D.C.
PUB DATE	75
NOTE	107p.
AVAILABLE FROM	American Political Science Association, 1527 New Hampshire Avenue, N.W., Washington, D.C. 20036 ($3.50 paper)
EDRS PRICE	MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	American Government (Course); Course Descriptions; Course Organization; Higher Education; *Individualized Instruction; Individualized Programs; *Pacing; *Political Science; Programed Instruction; *Teaching Methods
IDENTIFIERS	*Personalized System of Instruction; PSI

ABSTRACT

Designed to improve undergraduate political science instruction, this booklet contains four essays on how to integrate the Personalized System of Instruction (PSI) teaching method into an introductory American government and politics course. The essays discuss the basic components and current applications of PSI. The first essay sets forth the basic concepts of PSI and reviews how it has been used and with what results since its initial adoption in the United States in 1966. The second essay is a practical description for implementing the method in political science. The third essay discusses the relative strengths and weaknesses of using PSI in a political science course. The appendices to the third essay include a sample course outline and sample teaching materials for one PSI course on American politics. The fourth section presents an annotated bibliography of books and papers on PSI. (DE)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED121644

Instructional Resource Monograph/No. 2

SP 008 790

PSI a... Politi... Scien...

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL BY MICROFICHE ONLY HAS BEEN GRANTED BY
Sheila Koeppen

TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE NATIONAL INSTITUTE OF EDUCATION FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER

Using the Personalized System of Instruction to Teach American Politics.

Ralph B. Earle, Jr., editor

2

A Publication of
The Division of Educational Affairs
of the
American Political Science Association
1527 New Hampshire Ave. N.W.
Washington, D.C. 20036

FEB 12 1976

PSI AND POLITICAL SCIENCE:

Using the Personalized System of Instruction to Teach American Politics

Ralph B. Earle, Jr., Editor

American Political Science Association
1527 New Hampshire Avenue, N.W.
Washington, D.C. 20036

The preparation of *PSI and Political Science: Using the Personalized System of Instruction to Teach American Politics* was supported by Grant GY 9351 from the National Science Foundation to the American Political Science Association for a project to improve undergraduate education in political science. Sheilah R. Koeppen, Associate Director of the Division of Educational Affairs is the project director. Responsibility to the profession for project activities, 1972-1975, is exercised by this Steering Committee on Undergraduate Education:

Vernon Van Dyke, Chairman, University of Iowa
Vincent J. Browne, Jr., Howard University
Gloria Carrig, Loop College, City Colleges of Chicago
Martin Diamond, Northern Illinois University
Heinz Eulau, Stanford University
Betty Nesvold, California State University-San Diego
Jack Peltason, Chancellor, University of Illinois
Ithiel deS. Pool, Massachusetts Institute of Technology
James A. Robinson, President, University of West Florida
Stanley Rothman, Smith College

This monograph has been commissioned by the Steering Committee on Undergraduate Education. It has been reviewed by three qualified persons, including a member of the Steering Committee. The monograph is published under the auspices of the Division of Educational Affairs. However, the views expressed are those of the contributors and not of the Steering Committee or of the American Political Science Association.

© 1975 by The American Political Science Association, 1527 New Hampshire Avenue N.W., Washington, D.C. 20036, under International and Pan-American Copyright Conventions. All rights reserved. No part of this book may be reproduced in any form or by any means without permission in writing from the publisher. Printed in the United States of America.
ISBN 0-915654-04-0

Contents

FOREWORD BY EVON M. KIRKPATRICK iv

EDITOR'S PREFACE vi

I. A PERSONALIZED SYSTEM OF INSTRUCTION: BASIC COMPONENTS AND CURRENT APPLICATIONS
Robert S. Ruskin 1

II. PERSONALIZING INSTRUCTION IN POLITICAL SCIENCE
George Watson and Dickinson McGaw 21

III. TEACHING POLITICAL SCIENCE BY THE PERSONALIZED SYSTEM OF INSTRUCTION
Ralph B. Earle, Jr. 51

IV. BIBLIOGRAPHY ON PSI AND POLITICAL SCIENCE PAPERS ON PSI 101

Foreword

Among the major activities of the American Political Science Association, the publication of the *American Political Science Review* and the Annual Meeting provide for exchange of information about research. Other major activities aim to adapt research to teaching needs, particularly at the undergraduate level.

Since the Association's establishment in 1904, there has always been a committee concerned with undergraduate education and, in each decade, an education committee has issued a report recommending instructional goals and strategies. Today, we have a different concept of useful educational activity; the Association is helping prepare instructional materials that can be utilized by teachers and students. The regional seminars for college teachers in the 1960's supported by a grant from the Ford Foundation, were a notable first effort of this sort. The seminars helped teachers locate and use new sources of course materials and different methods of instruction. Several hundred political scientists participated in these seminars.

At the end of 1972, with the support of a grant from the National Science Foundation, the Association established a Division of Educational Affairs and began to develop publications providing teachers and students with instructional guides and useful materials. *DEA NEWS for Teachers of Political Science,* a newspaper received by all Association members; SETUPS, that are student learning materials prepared by faculty in a workshop hosted by the Inter-University Consortium for Political Research; and a Bulletin for undergraduates on *Careers and the Study of Political Science* are the initial publications.

PSI and Political Science: Using the Personalized System of Instruction to Teach American Politics is the second in a series of monographs on instructional resources for political scientists. In the last decade the Personalized System of Instruction has evolved as a distinct method of course design, one that has found wide application in the natural sciences and social sciences. As the merit of any method of instruction can be judged best when it is described with reference to specific subject matter, Ralph B. Earle, Jr., has selected and arranged the essays in this volume to present the Personalized System of Instruction and its utilization for teaching political science with illustrations for the introductory course in American politics and government. His essay about his research and teaching with *PSI* includes examples of units for an American Government course.

It is appropriate that *PSI* be reviewed with respect to the American Government course, which is typically taught to large numbers of students who differ in their knowledge and interest in politics. It is not unusual for American Government instructors to have insufficient information about what their students need to learn and actually are learning in the course and consequently about what they are accomplishing as teachers. Faculty who use *PSI* to design the course may be able to overcome the frustrations of this situation because this is an instructional method that provides continuous feedback about what students are learning and whether the course materials facilitate learning. Moreover, many political scientists who are assigned to teach this course specialize in some particular subject in American politics or in another field of politics, public policy or political theory. They may find that utilizing *PSI* will enable them to organize and teach a broad range of materials outside their area of special expertise.

These comments on the attributes of "personalizing instruction" are meant to encourage political science faculty to consider its merits as one of many alternative methods of instruction. To promote professional information discussions about this subject, we conclude this monograph with a selected bibliography from the literature about *PSI* by its developers and practitioners in other disciplines that includes citations to the papers about *PSI* in political science presented at recent meetings of our professional associations.

Evron M. Kirkpatrick
Executive Director
American Political Science Association
April 1975

EDITOR'S PREFACE

These three articles are intended to introduce members and associates of the political science profession to a new method of teaching at the college level. It is called the Personalized System of Instruction, and it was originally developed by Fred S. Keller, who is now associated with the Center for Personalized Instruction, 29 Loyola Hall, Georgetown University, Washington, D.C. 20007. The Center is the national clearinghouse for the method; it publishes a newsletter which tells of recent applications of the method to various disciplines.

Robert S. Ruskin, the contributor of the first paper, is the Associate Director of the Center. His paper sets forth the basic concepts of PSI, as it is abbreviated, and reviews how it has been used and with what results since its initial adoptions in this country, beginning in around 1966. George Watson and Dickinson McGaw, both at Arizona State University in Tempe, follow Ruskin with a how-to-do-it description for implementing the method in political science. And my contribution, based on experience in teaching American politics through PSI, discusses at some length the relative merits of the method as applied to political science, particularly in reference to the A.P.S.A.'s concerns about pre-collegiate education in political science. After the last article appear the course outline and sample teaching materials for one PSI course, so that you may get a better feel for how the method is put into actual practice.

PSI is not a panacea—if it were, you would have heard so by now. It is not applicable across the range of political science courses nor the range of political science departments. It is, however, an alternative method of teaching which can lay legitimate claim to peculiar strengths and accomplishments. If you want to find out what these are, as we used to say in sixth-grade book reports, you'll have to read the rest of the book yourself.

A Personalized System of Instruction:
Basic Components and Current Applications

Robert S. Ruskin

The Center for Personalized Instruction

and

The Department of Psychology
Georgetown University
Washington, D.C.

Preface

The author wishes to thank his wife, Beckie, for her invaluable assistance during the development of this manuscript.

Our traditional educational system has been the subject of criticism from many directions over the past few years. As the student population either stabilizes or decreases in many of our educational institutions, more and more attention is being given to the quality and effectiveness of the learning process. Often such a search leads to a closer examination of the traditional method of teaching—the lecture. So it was with Fred S. Keller. He began questioning the effectiveness of traditional education many years ago. He felt that the educational process could be enhanced by appropriately utilizing certain elements of learning theory. Putting his ideas into practice, Keller, over the years, developed a technique that has elicited a great deal of interest from instructors and administrators who are searching for methods of instruction that will increase the quality and effectiveness of their particular disciplines and institutions. That technique is the "Keller Plan" or the Personalized System of Instruction, better known as PSI. There is one main factor in the generation of such a high level of interest in this technique—it seems to work! To better illustrate this claim, let us examine the characteristics of both the lecture method and the Personalized System of Instruction.

Those who have taught by the lecture method are usually aware that every course seems to be composed of two specific groups of students—those who feel that the lecture is proceeding so fast that it is impossible to take adequate notes; and those who feel that the lecture is repetitive, boring, and a total waste of time. The lecturer must attempt to pace himself in such a way as to satisfy the "average" student. Unfortunately, no such creature exists. In a personalized course (PSI), the students pace themselves. The course is structured in such a way that whenever a student feels he is ready to prove his mastery of the required information, he comes to class and obtains the corresponding testing materials. The relevance of this factor lies in the recognition that no two students are exactly alike, and that these individual differences do affect the efficiency of the learning process. In other words, when students are forced to perform at a pace set by the instructor, their ultimate performance may be detrimentally affected by the time available to learn rather than actual scholastic potential.

Additionally, the instructor's pace (too fast for some, too slow for others) ultimately affects the quality and completeness of student notes. Thus, from the first day, the materials upon which students must depend for information and study are widely varied. This factor alone (the ability to write quickly and comprehensively) can determine a student's test performance regardless of the student's actual ability to master the required course content. This problem of the varying quality of notes is eliminated in the PSI classroom. At the beginning of the semester, in addition to the course textbook, all students are given supplemental and explanatory materials written by the instructor himself. There can be no confusion over whether or not one student's notes are more complete or correct than the next since everyone begins the course with identical base material.

A related problem of the lecture method of instruction is that of "accumulated ignorance". The student taking inadequate or confusing notes either tends to fall behind or must proceed with an inadequate base for cumulative learning thus leading to his or her ever increasing confusion and anxiety. There is much less confusion inherent in the personalized system due to the identical material base factor. If, however, a student should fail to fully comprehend part of the course material, the weakness will quickly come to light during the frequent unit examinations required throughout the PSI course. At that time, course personnel will promptly clear up any misunderstandings about course content. In this way, the very structure of the PSI system prevents the "accumulated ignorance" phenomenon.

This immediate check on student performance and understanding has one more benefit that should be mentioned. If the number of students having difficulty comprehending the course material is large, the instructor is being informed, although somewhat indirectly, that something is wrong. It should be apparent that his materials are not clear enough, his course content is too complex without well-developed study materials and/or his course units are too large. If the instructor remains flexible, he can utilize this feedback to improve his course *and, thus,* the quality of student learning.

In the lecture system, the student is usually a passive creature. His role is to sit, listen, and faithfully record what the instructor is saying. In many of our nation's classrooms, the class size is too great to allow for interaction. Even lecturers fortunate enough to teach small classes have difficulty interacting with each individual student. Furthermore, there are always students who hesitate, for many reasons, to initiate contact with the instructor. In PSI, each student is involved directly and actively in the learning process by a direct and personal interchange of information with course personnel. The class proctor, who immediately scores his unit test, is capable of intelligently discussing the material contained therein. Such a discussion can involve the student to a greater depth in the course material thereby clearing up any confusion

on his part. The very fact that the proctor is a fellow student and, therefore, is somehow less threatening to many than the professor, encourages an increase in student-initiated discussions. For those who wish to discuss a point further, the professor is continually available.

Finally, it is common practice in the traditional lecture system for one or two major examinations to determine a student's grade. These periods become aversive events in the student's life. Since most courses cover large content areas, student anxiety usually runs at an equally high level. The PSI method presents information in small, logically sequential steps or units. Although complete mastery of each is required, the student may repeat unit examinations (different tests) until that mastery is demonstrated. Thus, the detrimental effects of anxiety upon performance is eliminated as much as possible. PSI attempts to maximize rewards while minimizing punishment in order that the student be free to learn, at his own individual rate, to the best of his ability. As Born and Zlutnick (1972) state, "PSI strives to make students more alike—by making them all excellent."

The foregoing should make it evident that the lecture method does have inherent drawbacks. As Nelson (1970) points out, "the lecture method is basically aversive in that materials are presented in units which are too large for some students and too small for others; exams are given solely to determine grades rather than to assess a student's readiness to progress to new material; there is no recognition of the student as a unique individual; the student is required to be a passive receptor with no effective in-put into the classroom situation; and, finally, student motivation to learn is usually based on the fear of receiving a poor grade." The personalized system dispels these criticisms entirely.

The remainder of this article will deal with a brief history of PSI's development, why PSI is effective, and how PSI actually works in the classroom. Hopefully, the reader will emerge with an idea of what is involved in a personalized classroom and how it feels to organize and run a successful PSI course.

The Birth and Evolution of PSI

The roots of PSI go back to the 1920's when two young scholars, F.S. Keller and B.F. Skinner, began exchanging ideas and criticisms on the educational system. Over the years, that interest in the educational and learning process has continued to solidify and expand. During the 1950's, Keller became known as an innovative, creative teacher at Columbia University, devising courses that utilized principles of learning. This coincided with a general upswing in interest and research into less traditional means of education. During this same period, Skinner pointed out that effective learning and teaching do not happen by chance.

The state of research on education had evolved by this time to the point where it was generally recognized that the learning process could be enhanced by utilizing principles of psychology learning research. These principles were specifically that: learning is more efficient if the student is presented materials in small, logically related amounts; students perform (learn) appreciably better if they are constantly made aware of *exactly* what is important for them to know (thus eliminating student guessing games at exam time); students perform at a higher level and with less anxiety if they receive immediate feedback on their progress and performance in the educational system; and, punishment is usually detrimental to the learning process.

During the 1960's, Keller, along with J.G. Sherman and several other colleagues, set up courses at the University of Brazilia using various aspects of learning theory. Unfortunately, Brazil's political upheavals made it necessary to close down operations soon afterward. But, the conviction and excitement felt by the individuals involved continued. Keller and Sherman accepted positions at Arizona State University and continued teaching courses utilizing the ideas and techniques that had arisen from their experience in Brazil.

Both Keller and Sherman had delivered several papers on the as yet nameless teaching method by the late 1960's and professionals had begun to take an increasing interest in this new and successful technique. By the time that Keller published "Goodbye, teacher . . ." in 1968, the disciplines of physics and engineering had begun to use the "Keller Plan". The Personalized System of Instruction was off and running.

During the next few years, PSI made a substantial impact mainly in psychology and the physical sciences with many enthusiastic users as well as detractors believing that this particular method was suited only to those disciplines concerned with absolutes or large amounts of unwavering data.

As interest in this new method grew, there was a demand for greater and more detailed information. In 1971 and 1972, workshops on the "Keller Plan" began, first at MIT and later at Georgetown University. Since then numerous conferences and workshops have been conducted with ever-increasing professional attendance. The most recent gathering, the National Conference conducted in Washington D.C., had more than 780 professionals in attendance. As the interest has increased, so have the number of disciplines discovering the successful adaptability of PSI. The teaching community is fast becoming aware that PSI is *not* limited in its application, and that it is a successful and rewarding experience in fields of study ranging from physics to english composition. The *PSI Newsletter*, initiated by Sherman just three years ago, has grown to a readership of 3,000 encompassing professionals in at least 27 disciplines.

Why PSI Works

The Personalized System of Instruction is firmly based on the results of research in learning and motivation. The principles of learning and reinforcement are inherent in the system. Five major characteristics are fundamental to its basic structure. We touched briefly on these in the opening paragraphs. Let us now take a deeper look at each in order to help us to discover just why PSI is so successful.

a. *Communication between the student, instructor, and materials.* In most cases, the traditional textbook is the basic informational source. Obviously, this has many advantages to the instructor. Anyone who has implemented a PSI course will testify that there is more than enough work to be done without writing your own textbook. However, there is an almost universal feeling, regardless of discipline, that no textbook is truly adequate and relevant to one particular course. There is also the poorly written textbook, inadequate in content and depth and/or constantly confusing the students. Still another problem is that textbooks are written for as large a population as possible. As a result, they frequently omit or gloss over areas the instructor may feel need more attention. Although PSI utilizes traditional textbooks, it also provides the instructor the opportunity to stress areas neglected by the text.

In a PSI course, the instructor prepares detailed study guides that can be used to expand available information, or to delve into content not provided by the text. However, these study materials must meet certain criteria to be effective tools in the learning process. They must make the students aware of what they are expected to learn and how their learning will be assessed. Obviously, study materials will vary in content and style of presentation as a result of the instructor's orientation. What is most crucial is that the student knows exactly what is considered to be important and relevant, how much he is expected to master in a given period, and how his performance is to be assessed. After all, if an instructor cannot express what he wants his students to learn, it seems rather fruitless to expect the student to learn "whatever it is" efficiently.

Study materials can serve a variety of functions. There can be an introductory section tying in the present course with past materials the student has encountered. Such materials can also discuss strategies that the student can utilize in order to facilitate understanding the required content. Each individual instructor is free to emphasize areas, simplify text information, or pose study questions if he so desires, all of which should arm the student with the ability to complete the goals set forth by the instructor for each section or unit of study.

b. *Mastery of the unit.* An instructor developing a course must make many important decisions. Foremost among these is content. Once the instructor has sorted out what materials he feels are necessary

to the course, he must then consider whether or not the amount of material is reasonable in view of course parameters at his particular institution. The next step is to separate the course content into a logical sequence forming what Keller (1968) termed "units". Clearly the number and size of units will vary among individual instructors but it must be kept in mind that there are pitfalls ahead for those who utilize units that are too large, too numerous, or too small.

Once the instructor has logically prepared his course materials, he must deal with the "unit-perfection requirement". This term essentially means mastery of a certain area of content is required before the student can advance to new materials. (Keller, 1968) Mastery of each unit is an integral part of PSI and, in some ways, is the most difficult aspect for traditional lecturers to accommodate. As Sherman (1972b) explains, "the tests are not exams in the normal sense. Students are not penalized by a lower grade because of errors. The tests are not graded at all, but rather are a device and an opportunity for the student to demonstrate mastery, or detect confusions, the latter to be corrected before they lead to serious trouble.

"Roughly, rather than starting with 100, counting errors and subtracting points that are forever lost, the procedure is to count successes and add. The difference is not trivial; for it leaves the student free to try; free to fail; and, therefore, eventually more likely to succeed. It is the amount he masters that determines his grade. We judge our art masterpieces not by the number of preliminary sketches discarded along the way, but the final product produced."

The mastery concept does not assume that there are no individual differences in ability and skill of students; on the contrary, self-pacing and mastery assume that there will be differing rates of learning according to student differences but that each student is capable of attaining the final level of learning required by the instructor.

Many educators feel that if all students are capable of achieving mastery and, consequently, of passing the course at a high level, institutions will be unable to make judgments and discriminations between students. In most traditional institutions, the 'normal curve' is utilized for grade distributions. Upon close examination, however, the 'normal curve' is not really an appropriate yardstick with which to measure our educational success. Bloom (1968) points out that "there is nothing sacred about the normal curve. It is the distribution most appropriate to chance and random activity. Education is a purposeful activity and we seek to have the students learn what we have to teach. If we are effective in our instruction, the distribution of achievement should be very different from the normal curve. In fact, we may even insist that our educational efforts have been unsuccessful to the extent to which our distribution approximates the normal distribution."

I am sure that most instructors have found themselves in the uncomfortable position of being required to discriminate between an

"A" and a "B" student on the basis of one or two points, or by some ambiguous student quality such as "participation in class" which more accurately measures a personality variable than the student's proven understanding of the course content. When the quality and quantity of material available to each student is held constant, and each student is required to demonstrate mastery of each unit, there can be little doubt on the instructor's part as to how well a student has understood a given content area. This idea of mastery in the educational process leads logically to the concept of student self-pacing.

c. *Student self-pacing*. One of the most integral components of the PSI format is the concept of student self-pacing. Traditional methods of instruction would penalize a student who, for whatever reason, cannot adhere to the instructor's pacing of the course materials. The very idea of self-pacing implies recognition of individual differences among students. The personalized course is organized in such a manner as to maximize the attainment of scholastic potential in each student, regardless of an individual's rate of learning. Indeed, the concept of unit mastery as required by a personalized course, demands that the student's personal rate of progress not be arbitrarily defined by the instructor. In other words, the recognition that there are individual differences in ability and skill plus the requirement of mastery by *all* students makes it obvious that the rate of learning not be held constant. (Sherman 1972b) It is apparent that there are students capable of progressing through the course at a fast clip while there are students who will require more time in order to complete all course materials. It is a rare experience indeed for a student to study for and receive exams when *he* is prepared and not because he is forced to perform on an arbitrary date set by the instructor. "Indeed, aptitude could, under this method of instruction, be re-defined as the amount of time usually needed by the student to attain mastery of a learning task." (Carroll, 1963)

d. *Role of the proctor*. Some observers feel that the student-proctor is the most important feature in a PSI classroom. Proctors can be advanced undergraduates who have previously taken the course, graduate students, or students currently enrolled in the course. Keller (1968) describes the proctor as "an undergraduate who has been chosen for his mastery of the course content and orientation, for his maturity of judgment, for his understanding of the special problems that confront the student as a beginner, and for his willingness to assist."

It must be a fairly common yet depressing experience for an instructor to hear that he is so intelligent and advanced in his field that he cannot effectively teach the beginner-student. Unfortunately, in many cases, it would seem that this is true. The peer-proctor, however, finds it less difficult to explain subtleties of course content to fellow students in a simple, understandable manner. The proctor also eliminates some of the reticence felt by students to "ask a foolish

question". Many students who are reluctant to ask a highly educated professor questions on basic materials will not hesitate to discuss their learning difficulties with another student. This factor, along with unit sequence mastery most effectively eliminates possible areas of confusion quickly before the student must encounter more advanced materials.

The proctor system also frees the instructor from dealing with the "highly predictable, redundant, repetitive errors and questions that preclude his dealing with the complex, personal, and unique questions that only he is equipped to handle." (Sherman, 1971b)

Not only do the instructor and student benefit from the peer-proctor system, but the proctors themselves find great rewards within the PSI classroom. They are interacting with fellow students on a personal basis; they are learning to express themselves clearly in their chosen field; and, as a result, go on to perform in advanced courses at extremely high levels. It is important to keep in mind that the proctor is what makes this method of instruction personalized, and it is through his efforts that students are given immediate feedback on test performance, explanations of content, and "an enhancement of the social-personal aspect of the educational process." (Keller, 1968)

e. *Motivational devices.* The traditional lecture method is convenient for the instructor. He can teach large numbers of students in one place at one time. This has been the traditional vehicle for our educational system in the past and has been discussed previously. Yet there is a place for the lecture within the PSI format. The instructor who can lecture informatively and at the same time be interesting can be a highly reinforcing factor to students. Since the study materials, self-paced testing, and mastery of units are utilized to present essential information to the students, the instructor is free to present lectures on non-textual materials that are interesting and informative to all involved. If the students are aware that they must reach a certain level in the course before they are allowed to attend such lectures, the lecture then serves as a motivational factor influencing the student's progression through the course content. In such a way, the lecture can serve as a reinforcing and useful factor in the PSI classroom.

The Effective PSI Course

All the above features are included in PSI for one primary purpose: to increase the efficiency of learning. Self-pacing, unit mastery, and an emphasis on written materials are proven and effective variables in our educational system. When one considers the additional factors of peer-proctors and various motivational devices, it is apparent that PSI effectively utilizes current learning reinforcement theory. There has been some discussion to the effect that PSI somewhat eliminates competition. This is true only to the degree that now the student finds he is competing with himself instead of fellow classmates.

There are various reasons why institutions of higher education have been willing to allow PSI courses on campus. One very important factor is the fact that the PSI classroom does easily and quite successfully fit into the traditional university structure without undue disruption. The PSI format requires no special or elaborate equipment or classroom center in which to operate. Since traditional textbooks and materials are utilized, there is little added expenditure required of the university administration or of students. In the vast majority of cases, the PSI course readily fits into the established semester or quarter structure without requiring expanded class hours. It has been found, however, that students tend to progress through the course materials at a faster rate if the longer class meetings are utilized. This is probably due to the fact that a well-prepared student has sufficient time to take more than one unit in the longer sessions, and a student who has failed at his first attempt at a unit quiz has an opportunity to re-take the unit on the same day. On the surface, particularly as far as the traditional university structure is concerned, there is little to distinguish the PSI classroom from a traditional lecture course. It is only after an observer walks through the classroom door that PSI's distinguishing features become apparent.

Organization of the PSI Classroom

Generally, an observer's first impression upon viewing a personalized course is one of incredible activity. At a glance, it seems as if everyone in the room is in motion. Yet, it would be erroneous to conclude that the PSI classroom is a disorganized process. In fact, the opposite is true. After a few moments in the classroom, it becomes obvious that the activity *is* following some sort of pattern. One center of activity is that where unit exams are being checked in and out by student aides. The flow of traffic moves from there to a "relatively" motionless area where students are in the process of completing the exams. They then go directly to the student-proctor section to have their exams graded and discussed. At this point, a student may either go on to the next unit exam (after successfully mastering the previous one) or, if he has failed, may take another test form on the same unit. Thus, the observer will note a circular pattern of activity as students go from one center to the next and then repeat the process.

The instructor is seldom in one place for very long. His function is one of advisor and professor. He is free to move about the room talking to students, discussing relevant course materials, and supervising the test check-out procedures and proctor activities. But, as would be imagined, his tasks certainly do not end in the classroom. In order for the personalized course to operate smoothly, all elements within the system must be thoroughly prepared and systematically applied to the classroom. That's the hard part.

Well before the first day of classes, materials and organization of the classroom must be thoughtfully and carefully prepared. Anyone who has taught a PSI course will admit, this is not an easy task that can be finished in an evening or two of concentrated work.

First, the instructor must make the decisions common to all courses—what text he wishes to use, what area he wants to concentrate upon, what area in the textbook is deficient, how many students he feels he can effectively handle. After these initial decisions, he must begin to prepare materials relevant to a personalized classroom, all of which must be of sufficient quality to effectively guide the students. The instructor must never overlook the fact that no matter how well organized and efficient the actual classroom structure appears, the students cannot perform at satisfactory levels without comprehensive and complete course materials.

Two critical items which are absolutely essential to the successful application of PSI are the study guides and the unit test forms.

a. *Study guides.* Basically, study guides should give the student learning objectives for each unit so that he will be aware of what the instructor feels are important concepts and ideas. Obviously, any two individual instructors will compose differing materials for similar courses and in varying styles. What is important, though, is that the study guides present the course material in small and logically sequential units that enable the student to actively respond, commonly by solving problems presented within the study guide itself.

b. *Unit test forms.* There are many factors important to effective unit exams. The unit size is one important variable. It has been found in the past that PSI works best when the number of units roughly equals the number of weeks in the semester. If there are too many units, then, obviously, the student is not progressing through the course at his own pace but is being externally paced by the semester deadlines. An instructor who tries to include too many units will also have problems with students falling behind because there is insufficient time available for the student to repeat a unit test before the course structure forces him to move on. Once this occurs, the classroom will become an aversive experience to many of the student participants.

On the other hand, if the instructor includes too few units for a great amount of course content, the very length of the units themselves become aversive to students. In this case, students very often avoid taking the exams and the instructor is faced with student procrastination. It should be clear by now that even the size of the units is a crucial decision and one that should not be taken lightly. In all cases, the unit size and length should be reconsidered at the end of each semester, especially if the instructor has noted student behaviors similar to those outlined above.

Another factor involving unit exams is that the unit-perfection or mastery requirement necessitates availability of various forms of the

same unit exam. When compiling these multiple test forms, the instructor should always strive to insure that the various forms are equivalent in terms of the general categories of items presented.

Time required for completion is still another factor to be considered. If tests are 10 to 15 minutes long (such a time limit almost requires multiple-choice or short answer essay questions), students are afforded the opportunity to take several unit exams during the same class period or repeat an unsuccessful attempt, if necessary. It is highly reinforcing, especially to the student with adequate motivation and ability, to be able to come to a testing session and successfully master several unit exams.

In addition to preparing appropriate course materials, the instructor must also consider another vital component in successful PSI course management: personnel selected to operate within the system. Three major elements are necessary for efficient operation: the instructor, proctor, and class assistant.

a. *The instructor.* It should be apparent by now that the instructor's role begins far in advance of the actual PSI class. It is the instructor who must design the course structure, develop and distribute competent written materials (including study guides and unit test forms), select and direct course personnel, set up adequate bookkeeping practices, and cope with the inevitable day-to-day decisions regarding classroom policy. The instructor must also be present continually in testing situations. Students studying for exams as well as those who simply wish to further their knowledge in a particular area will need and appreciate the instructor's knowledge and resources. The instructor must be present to arbitrate any disagreements that may arise between a student and proctor over test items or answers. So, although his role is drastically changed from that required by the traditional lecture course, the instructor is, perhaps, even busier now. It should also be noted in passing that the time required to successfully undertake a personalized course is a great deal higher than that required by the lecture method.

b. *The proctor.* The proctor has, at times, been referred to as the most important aspect of the PSI classroom. It is through his efforts and availability that the course is "personalized". It would be physically impossible in large classes for the instructor to have the opportunity to discuss in depth every answer given by every student in the course of a semester. In most PSI courses, a ratio of one proctor for every ten students has proven to be effective.

The actual selection of proctors can be done in a variety of ways. External proctors (normally graduate students or advanced undergraduates) usually serve the entire semester. Internal proctors (students who have proven their mastery of the most course units by a particular test day) correct and discuss tests of their classmates who have not progressed as far in the course materials. The use of more advanced students as course proctors may add a slight competitive element to the

class structure and act as a motivating factor for students to move rapidly through the course in order to merit the position of proctor.

The observant instructor will note that the proctor gains much from his position. For many, it will be the first time their active participation in the educational process has been encouraged—indeed, almost demanded. They are able to discuss course content on a one-to-one basis with fellow students and with the instructor.

c. *Class assistants*. Class assistants are also necessary to the well-run PSI classroom. They are responsible for unit test checkout and security and for the ever-present bookkeeping necessary to the format. Class assistants and external proctors are usually paid a salary or given independent study credit. The class with less than 100 students should be able to operate smoothly with one or two class assistants.

Another factor for the instructor to consider is the final examination. Most PSI courses do include a final exam. This allows students to consolidate the materials they have previously mastered and can bring to light any students who have used less than laudatory methods for progressing through the course units. In general, the final examination should not differ in style from the unit quiz format. If, however, the instructor does not desire to administer a final exam, several well-placed review units throughout the semester can accomplish the goal of a final without inducing the level of anxiety usually associated with one-shot final examinations.

Normally, students receive only *one* final examination but there is no reason why multiple-final examination forms could not be administered until mastery is attained. In any PSI course, however, it is advisable to give the final exam throughout the semester so that students who have rapidly progressed through the course units can complete all the course requirements.

This would seem to be an appropriate place to mention the distribution of grades in a PSI classroom. If you take the normal curve and turn it upside down, you will get the general idea of the level of performance achieved by the majority of students in a PSI classroom. As Keller (1968) found, "most students will receive an 'A' with progressively fewer students receiving a 'B', 'C', or 'D' with a rise in the number of students receiving an 'F', incomplete, or withdrawal classification. It is not difficult to understand why this particular grade distribution is so common to PSI courses. Since the student is provided with all study materials and expected goals, receives immediate feedback on his performance, and participates in a testing format that eliminates any "failure" in the usual sense, he is constantly aware of his progression through the course at any given moment. Unlike the traditional course with a mid-term and a final, the student does not have to wait for the results of his last examination to know whether his overall course performance was of sufficient quality to merit a passing grade. The PSI student is well aware, from the first day of class, of how much

work is expected of him in order to receive a particular grade in the course. He has a great deal of lead-time in which to drop the course instead of plugging away to the final exam and discovering (too late to withdraw) that he did not pass the final. Considering these factors, it is not surprising that the PSI course will probably have a slightly higher withdrawal rate than is usually found in a traditional course.

In a PSI course, even more so than a lecture course, good management is essential. The selection of quality proctors and course assistants, the arduous preparation of study and test materials and additional motivational course activities cannot be over-emphasized. If the instructor has made a misjudgment in almost any area, he will be made aware of it until it is corrected. If the course has poor bookkeeping or too few proctors, long lines of students will form in various sections of the classroom. If the units are too numerous or too lengthy, the classroom will seem suspiciously empty until the last of the semester when students will be wildly attempting to finish the course. As in any course, it is best that the instructor be well-prepared and organized before the students enter the classroom. It is also important for him to be constantly observant of the student behaviors in the classroom and to evaluate his course management during and at the end of each semester in order to eliminate any organizational problems that may have appeared.

Contemporary Research

Since the widespread application of the Personalized System of Instruction has only blossomed recently, it is logical that the great bulk of research has taken place within at least the last five years. At present, it is difficult to ascertain exactly what effects PSI has on the learning process or what specific components of PSI are most effective and essential to effective teaching.

One of the major obstacles in measuring the relative success of PSI is that many studies attempt to compare it with traditional methods of teaching with the latter serving as a control. Frequently, an instructor will compare a new PSI course with the same course taught by the traditional method in a previous semester. This post-hoc selection of the control group poses many research problems in that there may be differences in the student population from semester to semester and, if the instructor has switched to offering a personalized course, it is possible that he has shifted his educational perspectives. In any case, the lack of adequate random selection or matching of students to serve in both conditions in between-subject experimental design make generalizations about the experimental results open to justified criticism.

A major difficulty also arises when within-subject experimental designs have been utilized. With an ABA design, and even when

utilizing a more complex multiple type, there is the possibility that residual effects from previous teaching methods will have an effect on subsequent variation of teaching methods.

Another factor which makes analysis of the literature so difficult is that many researchers do not use exactly the same methods when operating a personalized course. Frequently, individual instructors will modify or omit components of the Personalized System of Instruction thus making it difficult for a clear, concise picture to emerge from the current literature on research findings. While it is exceedingly difficult to draw irrefutable conclusions from the current research, the data collected in numerous studies do indicate some strong trends with regard to introducing the PSI format. These trends are presented here.

One of the most noticeable aspects of a personalized course is the increased number of students receiving "A"'s and "B"'s. There has been research done on the question of whether or not a student population sharing such high grades can perform at a higher level than a student population in a traditional course.

It has been found in numerous studies that the same instructor will assign more "A" or "B" grades when teaching a PSI course than in earlier semesters when a more traditional method was utilized (Keller, 1967, 1968, 1970; Moore, Mahan and Ritts, 1969; Hoberock, 1972). In addition, studies have been reported wherein students from both a traditional course and a PSI course have been compared on the basis of examination performance on the same course material (McMichael and Corey, 1969; Corey and McMichael, 1970; Moore, Mahan and Ritts, 1969; Gallup, 1974; Sheppard and MacDermot, 1970; Morris and Kimbrell, 1972; Witters and Kent, 1972; Alba and Pennypacker, 1972; Born, Gledhill and Davis, 1972). In varying degrees, all of the above mentioned studies have found PSI to be at least as effective, if not superior to, traditional instruction. Taken as a whole, these studies would seem to indicate that the utilization of PSI in the classroom will increase performance between 10 and 15 percent over more conventional techniques.

One of the most frequently heard criticisms of PSI is that its use is restricted to lower level academic skills and could not be utilized in conceptual or creative learning. However, Morris and Kimbrell (1972) have found increased performance by students in a PSI course requiring the demonstration of both recall and application of principles and concepts. Indeed, there seems to be a considerable amount of research verifying that PSI is effective in courses stressing the acquisition of complex academic repertoires (Sheppard and MacDermot, 1970; Born, Gledhill and Davis, 1972; Hursh, et al., 1973). However, this area is still immersed in controversy and a great deal of additional research, especially in areas outside of psychology, needs to be performed.

Critics of the PSI system also feel that students who have had

repeated exposure to text questions have an advantage over the more traditional control students thus creating a "practice effect" that would account for the increased level of performance by PSI students. Although many studies are unclear about the relative exposure of the two groups to test items, the McMichael and Corey (1969) and Corey and McMichael (1970) studies do not contain such a bias, yet still support the general findings of increased performance by students in the PSI group. Alba and Pennypacker (1972) also found that when students in both groups were exposed to final examination items on a random basis, the experimental group performance was significantly better.

It should also be noted that when a final exam is given greater in-put into the traditional course grade, the anxiety thus induced may adversely affect test performance. Unfortunately, much of the research on PSI does contain experimental weaknesses, all of which the reader must keep in mind when reviewing available literature. It is clear that a great deal of new research must be conducted which utilizes designs that will hold such factors constant or eliminate experimental biases before any definitive conclusions can be drawn about the increased level of performance so consistently found in personalized courses.

The National Scene

The preceding section on current research points out the need for further and more controlled experimental data. As in any newly-emerging method, the research becomes more refined and precise as the number of PSI courses increase. Such improved research is necessary if PSI is to continue expanding. Proven successes and effectiveness are the basis for the acceptance of PSI by skilled educators who will determine whether or not this innovative method of instruction will be integrated into existing institutional structures. With all of the aforementioned flaws in experimental assessment, PSI would seem to be a method that is capable of producing increased student performance and a more positive student response to the learning process. It is interesting to note that there are institutions that are currently operating large scale applications of personalized instruction. It may be that the success and data which arise from these operations will determine the eventual fate of PSI.

At the University of Texas at Austin, a two-year project funded by the Alfred P. Sloan Foundation has begun to investigate many of the research questions raised by current and past research. They will be looking into the relative cost of PSI, whether or not PSI materials developed by one individual can be utilized successfully by an instructor at another institution, and, the effects of learning habits acquired in a PSI course on later, more traditional courses. Their research is beginning to produce data in the following areas: whether students learn more effectively in a PSI course; factors affecting

procrastination and withdrawal problems; the significance of the inverted grade distributions commonly found in PSI; and the effect of a PSI format on subsequent long-term retention. These efforts, led by James Stice and Billy v. Koen, will prove invaluable as it is the first time PSI has been examined in such an extensive and systematic manner.

College IV, the Grand Valley State College of Allendale, Michigan, and the Permian Basin campus at the University of Texas, Odessa, Texas are also "experimental" programs. Both institutions are utilizing unitized, modular, and personalized methods. Their success or failure will definitely affect the adoption of such innovative techniques in other large institutions.

For the past two years, the Center for Personalized Instruction has been in existence at Georgetown University, Washington, D.C. The Center's primary function is to disseminate information and to provide leadership to the growing number of educators expressing interest in the personalized system. The Center has a permanent professional staff (J.G. Sherman, Ben A. Green Jr., and R.S. Ruskin) and is supported by the Fund for the Improvement of Post-Secondary Education of the Department of Health, Education, and Welfare, as well as the Carnegie Corporation of New York. The Center publishes the *PSI Newsletter,* sponsors a series of national and regional conferences and workshops, and is developing a clearinghouse for those interested in utilizing PSI.[1]

Predicting the future is exceedingly difficult since the number of educators employing PSI is steadily increasing. As the total number of users increases, so do the subtle modifications of the existing system of instruction. These modifications will probably shape the future course of PSI. As Sherman (1971) has pointed out, "the use of internal proctors (which is now commonly found in most PSI classrooms) was dictated by the fact that neither independent course credit nor funds for payment of external proctors were available." Such changes in the basic PSI system are almost a certainty as the number and variety of teachers using the method continues to increase.

It would seem reasonable that the use of PSI will expand to include secondary education institutions with more regularity. There are increasing reports of PSI being utilized in elementary, junior, and senior high schools. It also seems probable that the increasing phenomena of adult continuing education will begin to utilize PSI for very practical reasons. The system, itself, would be extremely beneficial to adults with full-time employment who would find the self-pacing and flexibility of the PSI classroom more compatible with a busy schedule than that allowed by the traditional lecture course.

In conclusion, through this article, we have hoped to present and review the basics of a system whose very flexibility should insure its continued impact in higher education during the years to come.

[1] More complete information on Center functions and copies of the *PSI Newsletter* may be obtained by writing the author in care of: The Center for Personalized Instruction, Georgetown University, Washington, D.C. 20057.

Bibliography

ALBA, E. & PENNYPACKER, H.S. Multiple change score comparison of traditional and behavioral college teaching procedures. *Journal of Applied Behavior Analysis*, 1972, 5, 121-124.

BORN, D., GLEDHILL, S. & DAVIS, M. Examination performance in lecture-discussion and personalized instruction courses. *Journal of Applied Behavior Analysis*, 1972, 5, (1), 33-43.

BORN, D. & ZLUTNICK, S. Personalized instruction. *Educational Technology*, 1972, 7, (4).

BLOOM, B.S. Learning for mastery. *Evaluation Comment*, 1968, 1.

CARROLL, J. A model of school learning. *Teachers College Record*, 1963, 64, 723-733.

COREY, J.R. & McMICHAEL, J.S. Using personalized instruction in college courses. New York, New York: Meredith Corporation, 1970.

GALLUP, H.F. Problems in the implementation of a course in personalized instruction, in J.G. Sherman, *PSI: 41 Germinal Papers*, 1974, 128-135, from a paper originally presented at "Personalized Instruction: a symposium in honor of Fred Keller," American Psychological Association Meeting, September 6, 1971.

HOBEROCK, L.L., KOEN, B.V., ROTH, C.H. & WAGNER, G.R. Theory of PSI evaluated for engineering education. *IEEE Transactions on Education*, 1972, *E-15*, (1), 25-29.

HURSH, D.E., WILDGEN, J., MINKIN, B., MINKIN, N., SHERMAN, J.A. & WOLF, M. Proctor's behavior and student's performance in a self-paced (PSI) undergraduate course. University of Kansas. Paper Presented at the Conference on Behavior Research and Technology, 1973.

KELLER, F.S. "Goodbye, teacher . . ." *Journal of Applied Behavior Analysis*, 1968, 1, 79-89.

KELLER, F.S. A personal course in psychology, in J.G. Sherman, *PSI: 41 Germinal Papers*. Menlo Park, California: W.A. Benjamin, 1974. Originally a paper written in 1967.

McMICHAEL, J. & COREY, J.R. Contingency management in an introductory psychology course produces better learning. *Journal of Applied Behavior Analysis*, 1969, 2, 79-83.

MOORE, J.W., MAHAN, J.M. & RITTS, C.A. Continuous progress concept of instruction with university students. *Psychology Reports*, 1969, 25, 887-892.

MORRIS, C. & KIMBRILL, G. McA. Performance and attitudinal effects of the Keller Method in an introductory psychology course. *Psychological Record*, 1972, 22, 523-530.

NELSON, T.F. Teaching and Learning at Kalamazoo College. Kalamazoo College, 1970.

SHEPPARD, W.C. & MacDERMOTT, H.G. Design and evaluation of a programmed course in introductory psychology. *Journal of Applied Behavior Analysis*, 1970, 3, 5-11.

SHERMAN, J.G. "A Permutation on an Innovation—A New Role for Proctors" (1971b); "The Theory Behind PSI" (1972b); in *PSI: 41 Germinal Papers* edited by J.G. Sherman. Menlo Park, California: W.A. Benjamin, 1974.

WITTERS, D.R. & KENT, G.W. An experimental evaluation of programming student study behavior in undergraduate courses. Department of Health, Education and Welfare, 1970.

Personalizing Instruction in Political Science

by
George Watson and Dickinson McGaw
Arizona State University

SOCRATES: Now then, Menon, what do you think? Was there one single opinion which the boy did not give as his own?

MENON: No, they were all his own opinions.

SOCRATES: Yet he did not know, as we agreed shortly before.

MENON: Quite true, indeed.

SOCRATES: Were these opinions in him, or not?

MENON: They were.

SOCRATES: Then in one who does not know, about things he does not know, there are true opinions about the things which he does not know?

MENON: So it appears.

SOCRATES: And now these opinions have been stirred up in him as in a dream; and if someone will keep asking him these questions often and various forms, you can be sure that in the end he will know about them as accurately as anybody.

—Plato, *The Meno*

Probably most readers of Plato's Socratic dialogues have been impressed and intrigued at the manner in which Socrates inculcated new knowledge and understanding in his "students." There are several factors in the technique of Socrates that enhanced his effectiveness in restructuring the cognitive elements of his students' minds, but the most notable feature in the method of Socrates is the dialogue form itself. The dialogue is a very personalized form of instruction, which permitted Socrates to tutor his students on the basis of the information they already possessed and on each student's unique manner of analysis and comprehension.

The dialogue disappears from the later writings of Plato, and the style of Plato's famous student, Aristotle, reflects more the style of a master imparting wisdom to his students through the written word and the lecture. Prior to the time of the easy dissemination of the written word, the lecture technique was adopted as the most efficient, effective, and inexpensive technique to convey information from teacher to student. Institutions which subsequently evolved for the purpose of educating the children of the elite reflected this commitment to the lecture method. However, the use of the lecture did not mean that personalized dialogue between teacher and student disappeared. Whereas the lecture was useful in the dissemination of information, true understanding was more likely to be facilitated through the interaction of instructor and student.

When mass education became a national objective, the nature of educational institutions began to change. Classes became larger. The variation in the abilities and interests of the students increased. The time available for interaction between instructor and student greatly diminished. The simultaneous influx of printed materials and, more recently, of audio-visual materials vastly increased the amount of information processed by most students today, albeit without necessarily promoting understanding and evaluation of that information.

Educators have begun to seek efficient and economical instructional alternatives that will enhance the student's understanding. This paper focuses on one such method, broadly labeled, personalized systems of instruction (PSI). Our presentation examines the learning principles that underlie personalized systems of instruction, the procedure for establishing and implementing such a course of instruction, and an evaluation of the PSI approach.

PSI Principles

The term, personalized system of instruction, apparently derives from the description used by Fred Keller (Keller, 1966) to describe a method of instruction developed by Keller and Gilmour Sherman in the mid-1960's. Other terms, such as contingency managed instruction and individualized instruction, have been used to describe techniques

similar to Keller's. Although these three terms perhaps can be distinguished from each other, they commonly have been used interchangeably. Taken literally, the term "personalized" implies an attention to the individual as a person in a much more human manner than either of the other two terms.

Despite this emphasis on the "personalization" of a course, the basic Keller PSI approach and other modifications of it normally appear to place a personalized format upon a superstructure of sound, effective learning principles that are not unique to PSI. Although the research findings concerning these learning principles are not yet conlcusive, the evidence thus far does seem to support these hypotheses upon which PSI is based. (See Carr, 1962; Keller, 1967; Mager, 1968, and Kemp, 1971). It is also true that these principles are not always mutually reinforcing, and certain inconsistencies may appear in an effort to implement them all. Moreover, certain of these principles may be incompatible with certain constraints created by the requirements of a particular course or certain objectives desired by the instructor. It is important, therefore, that instructors who wish to implement a PSI format in a course understand the various principles underlying PSI in order to develop an effective PSI course.

The first two principles normally found in PSI can be applied to almost any instructional approach.

1. Specification of objectives. Learning improves if the student knows precisely what learning outcomes are desired and reinforced by the instructor. The use of learning or performance objectives clarifies for the instructor and the student the scope, content, expectations, and goals for the course. Objectives specification follows certain principles that enhance the utility and clarity of the objectives. These principles are important, and those who are unfamiliar with them should consult the work of Robert Mager (1962) or Norman Gronlund (1970) or some other qualified source. In our estimation, this initial principle constitutes the beginning and most important step in implementing PSI or any other instructional design.

2. Evaluation/objectives congruence. Learning improves if the evaluation of the student's performance is consistent with the specification of objectives given the student. This principle may seem obvious, but it is surprisingly easy for test items or other evaluation items to be constructed that are not part of the objectives specified by the instructor. Learning objectives constitute directions to the student concerning what he is to do and know in the course. Deviation from the objectives in evaluation does little to promote learning and can create a psychological climate that hinders effective learning. Considerable attention is given in this paper to evaluation. PSI offers unique and valuable methods for evaluation. Despite this emphasis, those instructors who do not evaluate the performance of their students can still utilize personalized instruction.

A second group of principles have their origin in Skinnerian learning theory. These principles form a basic foundation in individualized instruction and programmed instruction.

3. Active responding. Learning improves if the student is engaged actively with the subject matter and if the student actively responds to the subject matter. Active responding is unlikely to be experienced in lectures or large class discussions or in textbooks that do not engage the student in interaction with the printed material. It is also important to note that response alone is not enough to insure learning. Immediate feedback on the response and reinforcement of appropriate responses complete the learning effectiveness initiated by the active responding.

4. Small (short) units of instruction. Learning improves if the subject matter is well-organized into relatively small segments or units of information. In general, the ability to master information or the performance of certain tasks is inversely related to the amount of information or number of tasks required to master.

5. Frequent evaluation. Consistent with the previous principle, learning improves as the frequency of evaluation or feedback increases. The use of short units loses its effectiveness if feedback and evaluation are not utilized also to check the student's mastery.

6. Immediate feedback. Learning improves if the student is given immediate knowledge of the results of his performance. Immediate feedback insures that student interest and awareness of the subject matter and of his performance are optimal. Appropriate aspects of the performance are reinforced at a time when they are most prominent in the mind of the student. Inappropriate aspects of the performance must be noted in order that those behaviors or responses not be learned.

7. Spaced learning. In a course, learning is more effective if it is spaced throughout the time allotted for the course rather than massed at one or a few times during the course (*viz.*, at test or paper time). This principle is compatible with the principle of small units or information. In fact, the advantage of creating small units can be negated if the units are simply massed together and covered with undue haste in a short period of time. The possible conflict between spaced learning and the self-pacing feature of PSI is a problem which will be discussed in more detail later.

8. Positive conditions and consequences. Learning improves if, whenever the student is responding to the subject matter, he is also in the presence of positive conditions and consequences. The more positive the consequences for the student, the more likely he is to learn. Negative conditions and consequences also can stimulate learning. However, aversive stimuli may have adverse effects not desired by the instructor.

One feature of Keller's PSI format is a competency-based approach

to the course material. Although not universally accepted in PSI formats, we may still list the principle.

9. Mastery before advancement. Learning improves if the mastery of the material is required before advancing to new material. A key feature of the Keller PSI format is unit perfection mastery. A perfect score must be attained on the unit evaluation device before advancement to further units is permitted. Some PSI instructors deviate from perfection and adopt what might be called a minimum performance level that must be attained before further advancement in the course. The mastery criterion has been a source of experimentation, even to the point of abandoing it in some PSI formats.

PSI is a form of individualized instruction. As such, it is common to utilize in PSI the basic individually-paced format.

10. Self-pacing. In general, learning improves if each student can proceed through the material at a speed commensurate with his ability and other demands upon his time. This principle, basic to the Keller PSI plan, currently is undergoing careful scrutiny. Certain conditions may qualify the application of this principle, and certain course constraints commonly frustrate its unconditional implementation. This entire matter will be the subject of a later section.

The implication of the term "personalized" in PSI is that personal attention is given each individual in the course. The opportunity for a one-to-one interaction with the instructor or tutors (proctors) or other students is the major feature that distinguishes PSI from other instructional techniques.

11. Tutorial instruction. It is a postulate of PSI that learning improves as the student experiences increased interaction with his instructor or a tutor. Interaction with a tutor or instructor benefits the student because of the opportunity for individual attention to him, his problems, and his thoughts. This not only enhances effective instruction in the course subject matter; it often creates positive psychological attitudes and confirms the identity of the student as an individual person, still unique in a system of mass education.

Implementing a PSI Course

Our own experience in using PSI formats has focused principally around a course entitled "Empirical Political Inquiry." This course is required of all political science majors at Arizona State, and it provides undergraduates an introduction to research methods and data analysis techniques. Some initial efforts are being directed toward using PSI type formats in other courses, such as American Government and Political Socialization. We have implemented a variety of PSI formats, manipulating various applications of the principles presented in the previous section. This section is designed to provide an explanation and analysis of the many factors involved in establishing a PSI course.

There are at least five identifiable steps in the implementation of a PSI format: 1) specifying objectives; 2) assessing the entrance status of the students; 3) selecting resources and activities; 4) acquiring the physical facilities; and, 5) establishing and implementing the course framework. The first four steps identify areas that must be examined and evaluated in order to determine if a PSI framework can be utilized at all. The fifth step concerns certain procedures and alternative choices in the actual creation and implementation of a PSI format.

Specification of Objectives

The specification of course and unit learning or performance objectives is a key element of systematic instruction. A learning objective is a statement that identifies a learning outcome intended by the course instructor (Gronlund, 1970:1). If an instructor is able to define precisely what outcomes or student behaviors that he expects as a result of his course and if he can specify them in terms of stated objectives, then several beneficial consequences follow. First, the instructor has clarified for himself and his students precisely what students in the course are expected to do. Second, students are able to rely on the objectives as guides to direct their study efforts. Third, the objectives guide the instructor in the selection of course materials, teaching methods, and subject matter to be covered. Finally, objectives also serve as a useful guide in the creation of evaluation devices to measure the fulfillment of the objectives.

The use of instructional objectives is facilitated by the use of educational taxonomies (Bloom, *et al.*, 1956; Krathwohl, *et al.*, 1964). The widely accepted division of the taxonomy of educational objectives into the cognitive, affective, and psychomotor domains assists an instructor in identifying the learning outcomes he desires for his course. The cognitive domain includes knowledge, comprehension, application, analysis, synthesis, and evaluation as cognitive or intellectual skills. The affective domain relates to feelings and emotions, such as: receiving, responding, valuing, organizing values, and internalizing values or value complexes. Psychomotor objectives refer to actual physical skills, such as typing, operating a keypunch or calculator, or other physical operations.

Objectives for any one course may cover all levels of any, or all of the taxonomic domains. Moreover, the use of objectives does not limit the instructor to the specification of only observable behavior. The student can be asked to feel, to create, to appreciate, to imagine, as well as to recall, to calculate, to explain, to analyze, and to evaluate. It is likely, however, that most instructors will prefer to make an evaluation of each student on the basis of some observable behaviors or performances. This does not mean that other objectives cannot be stated, but it is incumbent upon the instructor to specify which ob-

jectives will be evaluated. Then, both instructor and student will know the behaviors for which students will be held accountable.

Assessing the Entrance Status

The need to assess the entrance status of students entering a course is not unique to PSI. In almost any course, it is beneficial for the instructor to know about the needs, goals, characteristics, and competencies of the students who will take the course. This becomes even more important for a PSI course, however, whenever an effort is made to individualize course material and instruction to each student's situation.

Two of the most common, but unreliable, techniques for gathering this initial information are intuition and impression. Three somewhat more reliable methods commonly are used in assessing the entering status. First, some instructors design and administer pre-tests on the information covered in the course or in particular units to determine the amount of pre-existing mastery of the course material. This technique can be used to place a student at a particular point within the sequence of material covered in the course. Simultaneous questionnaires can gather other information on the students unrelated to mastery of course content. A second technique of assessing the entering status involves the acquisition of such available data as test scores, grades, and transcripts that provide some insight to the student's academic skills. Finally, the instructor can schedule conferences with each student in order to determine his level and kind of motivation, home and work environment, self-concept, and amount of pre-existing knowledge of the course content area.

The content and the amount of variation in the entering status can be used to tailor the scope and methods used in establishing the PSI course. For example, a lack of variety in the needs and goals of students can permit a more narrow range of alternatives in the instructional materials. On the other hand, a great deal of variation in entering competencies enhances the value of a self-paced as opposed to an instructor-paced format. Such variation further suggests the flexibility of permitting students to enter the course at different points in the instructional sequence, consistent with demonstrated competencies. Variation in the needs and goals of students suggests the possibility of providing a more varied content to the course, consistent with the content of student needs and goals.

Of course, decisions concerning course objectives and materials normally must be made prior to the actual beginning of the class. Most instructors, however, can estimate the beginning status on the basis of having ascertained the entering status of prior classes or other factors. Such estimation usually should be accurate enough to permit objectives and resource materials to be specified and to establish the

basic PSI framework to be employed. Any adjustments required once the actual entering status is determined should be minor.

Selecting Resources and Activities

Resources and activities must be selected on the basis of the course objectives and the assessment of entering behaviors. (Sometimes the lack of proper resources requires the restatement of objectives in order that the objectives and course materials are consistent with each other.) In general, the PSI instructor must decide which objectives can be learned most effectively by the learner on his own, through group interaction, by formal presentation, or with individual tutoring. PSI normally can take full advantage of the wide range of resources and activities that are increasingly available to instructors (Wilson and Tosti, 1972: 43-60). In fact, since students may vary a great deal in their responses to certain learning environments, PSI promotes the flexibility of varying the resources and activities for individual students.

Fred Keller's PSI format relies heavily on written materials. Keller notes that as one of the five major features of his technique (Keller, 1968: 83). The reliance upon written materials is largely necessitated by Keller's self-pacing format. In such a self-paced format, the utilization and selection of resources is complicated by the fact that students are spread out along the sequence of material in the course. The use of materials and techniques designed for use in groups are implemented less easily. Certain resources, such as films or speakers, often cannot be retained indefinitely while the students progress individually to that point in the course. Creation of learning resource centers with a full complement of audio-visual equipment has assisted somewhat in providing the capability to retain such resources over longer periods of time. Activities requiring group interaction may necessitate some compromise of complete self-pacing in order to accumulate enough students at the same point in the progression sequence to engage in the interaction.

A factor that complicates the selection of reading resources in a self-paced format is the fact that much of the initial understanding of the material by the students comes from their own reading of the resource material. The type of materials that are most effective in such a PSI format are those that are consistent with the PSI principles listed earlier. Especially appropriate are those materials that: 1) specify learning objectives; 2) divide the material into relatively small chunks or units; 3) promote active responding among the students; and, 4) provide immediate feedback to the student concerning the appropriateness of his response. Although such materials are scarce in political science, the situation is improving. As PSI gains wider acceptance and usage, books and course packages will be published which will fulfill the principles and needs of PSI instruction.

The Physical Facilities

The type of physical facilities required to support PSI formats depends primarily upon how many functions are operating simultaneously. If tutors are used in the course, then each tutor needs to have a location to carry out his interpersonal interactions with students. Areas for study, for quizzes, for waiting on tutors, are all useful areas to have. In one course, we have had an optional lecture in one room, unit quiz taking and studying in another, and tutoring and grading in yet a third room. On the other hand, it is also possible to have only one room in which studying, quiz-taking, tutoring, and grading all occur simultaneously. Whenever quizzes are administered in one room, but graded in another, any completed quiz is folded over and stapled or sealed, and the time and initials of the test proctor are written on the test. The student then takes the quiz to the tutorial area to have the quiz graded.

Few of us are ever in the position of designing our own classroom facilities. Nevertheless, Figure 1 depicts two examples of convenient PSI facilities, not including a conventional lecture classroom if lectures are utilized or any special equipment room that may be needed in a particular course.

Establishing and Implementing the Course

The variety of PSI courses probably is limited only by the number of such courses that are offered. Even our own PSI system varies according to the nature of the course each of us is teaching. In this section, we shall describe various features which can be manipulated to produce alternative PSI formats. We begin with a diagram of two examples of PSI frameworks, which adopt many opposite positions on certain of the PSI principles. These two substantially different PSI formats will serve as a departure and reference point for the elaboration of alternative ideas in establishing a PSI course. Other alternatives that share features of both examples will be suggested, and the reader is encouraged to design additional alternatives of his own.

The first PSI technique to be presented contains as its main distinctive features a system of self-pacing, student tutors, mastery before advancement, and no lectures. This approach is quite similar to the basic Keller PSI framework.[1] The second technique employs instructor-pacing, limited student tutoring, automatic advancement regardless of mastery, and instructor lectures over the material.

The core of the instructional sequence for the mastery self-paced approach is presented in Figure 2. The procedure for mastering each unit begins with the student's exposure to the material. We have discussed already the variety of materials that might be employed, but more often than not, printed materials form the major source of information for the students. The student studies the material, guided by the objectives specified for that unit. Any questions that the student

Figure 1. Two Types of Convenient PSI Facilities

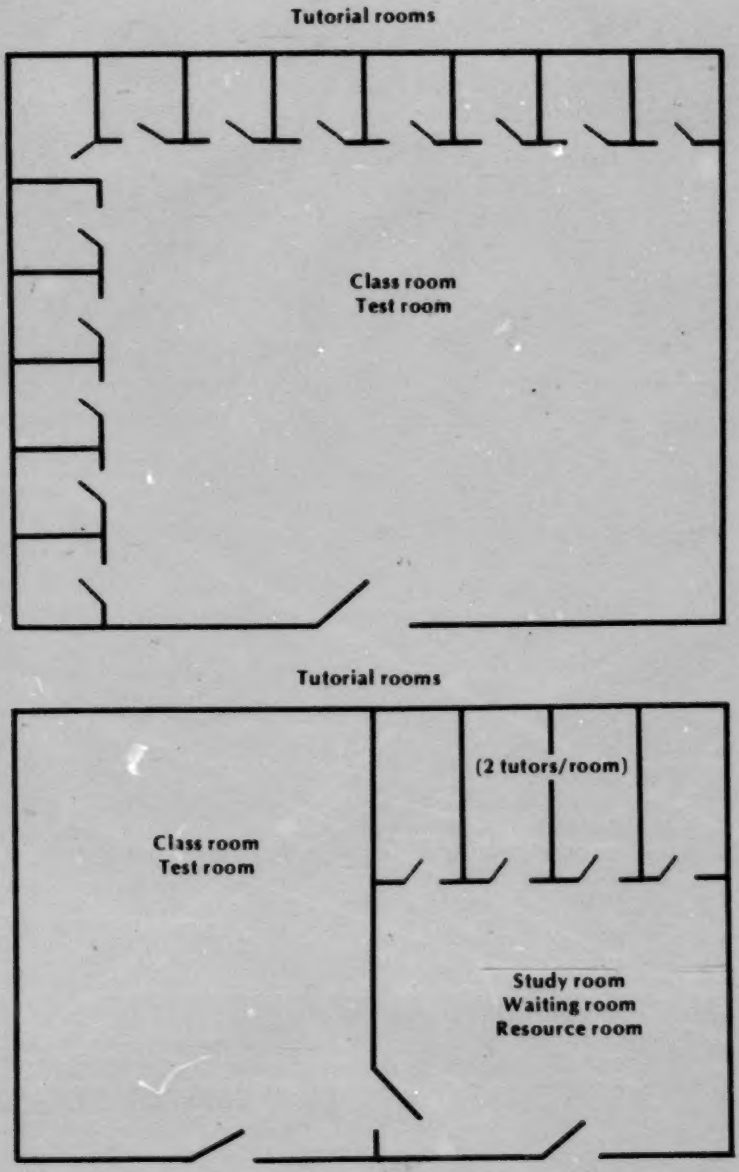
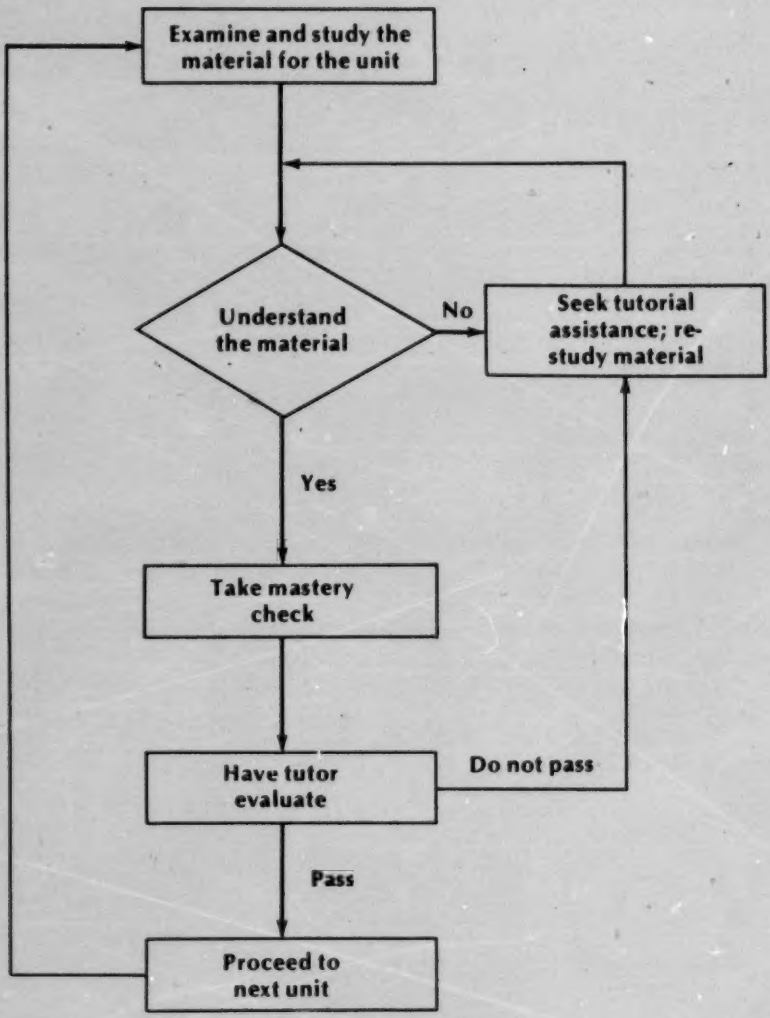


Figure 2. A Self-Paced, Unit Mastery PSI Instructional Sequence

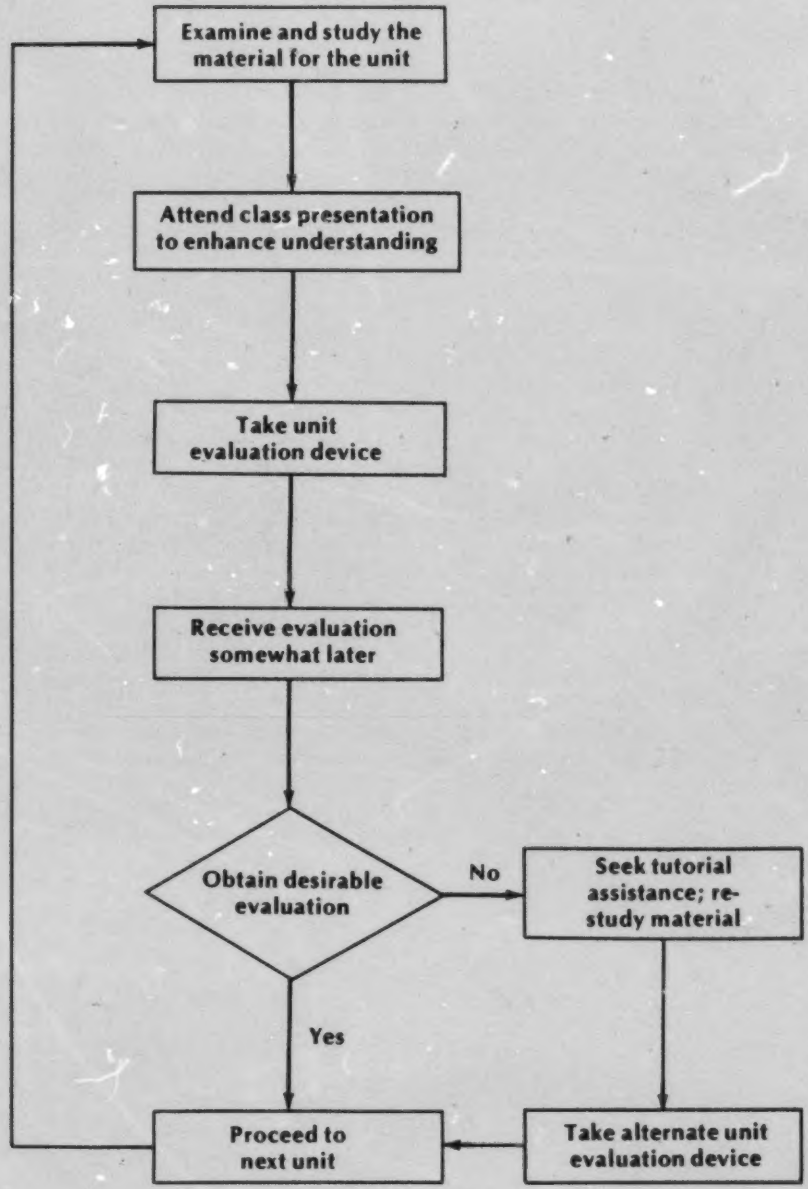


cannot solve on his own are handled in a session with a tutor. Whenever the student feels that he can fulfill the objectives specified for the unit, he can perform the mastery check. The mastery check is an examination, a paper, or some other performance in which the student's mastery of the objectives is evaluated. The use of tutors enables the mastery check to be evaluated immediately by the tutor in the presence of the student. If necessary, a tutorial session transpires, a transaction which will be detailed later. The student who passes the mastery check is permitted to proceed to the next unit. (We also defer for the moment a discussion of what constitutes mastery.) The student who does not pass the mastery check receives any tutorial assistance necessary to assist him in understanding the material. The mastery check is then performed again, normally a different version covering essentially the same material. This sequence is repeated until the student passes the mastery check.

The core of the instructional sequence for the non-mastery instructor-paced PSI format is presented in Figure 3. Instructor-pacing is simply a new label given to a very traditional approach. It indicates that the class covers the material whenever it is assigned by the instructor. The frequent unit evaluations require that the student keep up, but in this particular scheme he may not advance ahead. The Figure 3 design does assume that small units with frequent evaluation are employed. This PSI format provides for a single lecture over the material with two opportunities for evaluation. Unit mastery is not required; rather the higher score or rating on the evaluation device is recorded for that unit, presumably to be used in the determination of a final course evaluation. A reduction in the number of tutors required to support the class is attained by not grading each student's performance immediately in the presence of the student. Immediate feedback can be provided by making available for inspection the appropriate responses or behaviors. This seems to satisfy most students. The few tutors used in the course can then provide individual and immediate attention to those students who have the most difficulty with the material. If the student is dissatisfied with his performance on the first evaluation, he may take a second form of the evaluation device. After the completion of the two opportunities for evaluation on each unit, all students proceed to the next unit, regardless of their performance on the evaluation devices.

These two instructional sequences demonstrate the possible divergence of formats which can occur whenever more or less emphasis is given to various PSI principles. A compromise version of these two approaches has been used at the University of Kansas by George Semb and his associates (Semb, *et al.*). Semb adopts a unit-mastery, student-tutored, PSI format with an incentive-pacing scheme. The incentives to maintain the instructor-prescribed pace can be either the deduction of points for falling behind schedule or the addition of

Figure 3. An Instructor-Paced Non-Mastery PSI Instructional Sequence


Examine and study the material for the unit
Attend class presentation to enhance understanding
Take unit evaluation device
Receive evaluation somewhat later
Obtain desirable evaluation
No
Seek tutorial assistance; re-study material
Yes
Proceed to next unit
Take alternate unit evaluation device

bonus points for staying with the schedule. In essence, then, Semb's instructional sequence is similar to that in Figure 2. An alternative to the rigid pacing approach in Figure 3 is simply to permit students to progress faster than the scheduled class pace.

Despite the differences between the two PSI designs just diagrammed, their adherence to basic PSI principles is still quite pronounced, especially when compared to a conventional lecture course. Figure 4 provides such a comparison.

It sould be abundantly clear that PSI differs considerably from the conventional lecture approach. It is likewise obvious that certain choices must be made in combining the various aspects of Psi principles into a unified course framework. PSI also requires some special preparation and implementation. The next few subsections elaborate more fully several factors in the establishment and implementation of a PSI format. The factors discussed are: the selection of tutors; student orientation to the course; tutorial sessions; pacing; evaluation methods; grading schemes; and the role of the instructor.

Selection of Tutors. The use of tutors (Keller's "proctors") to assist the instructor is a key element in the personalization of instruction. Tutors enable the instructor to provide one-to-one personal instructional interactions that normally would be impossible to attain. One could argue that the attainment of such one-to-one personal instructional interactions is essential in order to qualify as a personalized system of instruction. The opportunity for a student to receive personal attention to and assistance for his own problems and questions is both an academic and humanistic achievement. Of course, the benefit of the personalization depends upon the quality of the interaction. Some interpersonal interactions could be damaging, both intellectually and personally. For this reason, the recruitment and selection of tutors is a crucial element in the success of PSI courses.

Various techniques have been employed in the recruitment and selection of tutors for courses. The three major sources of tutors for an undergraduate course are: graduate students, students who have already taken the course, and students currently taking the course. Although there are some merits to the latter source of student tutors (Wilson and Tosti, 1972: 70), we rely primarily on students who have already completed the course. The undergraduates who have demonstrated competency in the material appear to be just as effective as graduate students, and, in fact, often relate to the students in the course better than the graduate students.

Our selection of a tutor is based on: 1) a mastery and understanding of the material as a student in the course; 2) the ability to communicate effectively with others; 3) evidence of maturity, reliability, and a sense of fairness; and, 4) enthusiasm for the task. We extend normal course

Figure 4. Application of PSI Learning Principles in a Conventional Lecture Course and Two PSI Type Formats

	Conventional Lecture	Self-Paced Unit Mastery PSI Format	Instructor-Paced Non-Mastery PSI Format
Learning Objectives	Often vague, unspecified	Specified, for each unit	Specified, for each unit
Student Response Orientation	Passive	Active, with materials and tutors	Active, with materials, less so with tutors
Organization of Material	Normally covers large portions at a time	Short units	Short units
Evaluation Frequency	Usually infrequent exams and/or paper	Usually evaluation after each unit	Usually evaluation after each unit
Spacing of Learning	Instructor sets pace, but infrequent evaluation promotes learning effort massed at test time	Learning can be spaced, but tendency for much learning to be massed at end of term	Learning is spaced by instructor's pace, enforced by frequent evaluation
Mastery of Material	Mastery is not sought; grades given on performances	Unit mastery of material required before advancement to new material	Mastery is not required; grades given on performances
Pacing	Instructor sets class pace	Student sets own pace	Instructor sets class pace
Personal Instruction	No tutors; limited opportunity for one-to-one interaction with instructor	Enough tutors to provide personal tutorial instruction to all whenever needed	Only enough tutors to provide personal tutorial instruction on occasion

credit to our tutors for their work. Their primary duties consist of grading mastery checks and tutoring any students who need assistance. They also perform administrative duties attendant to the course, such as administering mastery checks or evaluation devices and making certain that all exams are accounted for at the end of the day. Since we do extend full course credit to each of our tutors, we also outline with each one an individualized course of study that extends his education in an area compatible with the content of the PSI course.

Since the quality of instruction in PSI tutorial courses depends to a large extent on the quality of the tutorial sessions, it is important to 1) select tutors carefully, according to the criteria stated in the previous paragraph; 2) develop in the tutors an understanding of the material that goes beyond that required even at the "A" level of mastery for the course; 3) secure effective tutorial behavior designed to maximize student understanding of the material; and, 4) promote consistency and reliability in the grading and tutoring of students.

In addition to the careful selection of tutors, certain training techniques help insure the attainment of these four conditions. First, during their terms as students, tutors are socialized to the role of a tutor through their own interactions with tutors and hopefully with the instructor in his role as a tutor. Moreover, tutors receive explicit instructions from the instructor on the fine points of tutoring and grading. Video tape presentations of proper tutorial techniques can be quite instructive. Students also participate in tutorial workshops designed to deepen their understanding of the course materials and to discuss any tutorial or grading problems that have arisen. Tutors are encouraged to seek assistance from other tutors or the instructor in the event of any uncertainty in the evaluation of student responses on a unit evaluation device or in the explanation of material in a tutorial session. Finally, the instructor is always available to any student who feels slighted by the tutor's grading or who would prefer to obtain information or an explanation directly from the instructor.

PSI instructors find that the tutors take their work seriously and interact well with the students in the course. Most students seem to be more willing to ask questions and seek help from the student-tutors than from the regular instructor. Some instructors assign students to a particular tutor with the assumption that better rapport and greater familiarity can be attained in the student/tutor relationship. We prefer a "free market" access of students to tutors on the basis that it facilitates the rapid access of students to tutors, enhances the likelihood of compatible student/tutor relationships, and does not seriously impair rapport and familiarity. Of course, some students seem unable to get along with the tutors. More often than not, these difficulties involve the inability of the student to accept the authority status of the student-tutor. Normally, this situation can be resolved by the instructor's assumption of the tutorial role for such students.

In addition to the personalizing function, the tutorial feature of PSI contains certain extrinsic benefits. One such byproduct of the tutorial program is that it provides an incentive for students to attain high evaluations, in order that they too can become tutors. Another by-product is that the tutors become a peer group of highly motivated students who enjoy interacting closely with an instructor. The tutors constitute an elite group of serious undergraduate students who are approaching a graduate school type experience.

The number of tutors required for a given PSI course may vary with the type of course. Obviously, the lower the student/tutor ratio, the more personalized attention that can be given to each student. We have experimented with student/tutor ratios as high as 20 to 1. This ratio prevented our normal procedure of the tutorial grading of each student's unit quiz in the student's presence. With the high ratio, students had to hand in their unit quizzes to be graded in their absence. However, they were permitted to peruse the suggested correct answers immediately and to return later to ascertain their own quiz score. With so few tutors, emphasis was placed on meeting the needs of those students who were experiencing considerable difficulty. The others received much less personal attention, but most everyone seemed to receive the assitance that was needed. With a lower student/tutor ratio, all students can receive more attention. A ratio of approximately 8 to 1 is usually an acceptable figure.

There may be a limitation on the number of tutors and students that one instructor can supervise effectively. This limitation is determined by the physical facilities, the nature of the course, and the capacity of the instructor to supervise effectively. We personally prefer a class size that permits the instructor to become acquainted and familiar with each student. Those who would take a less personalized view of the instructor's role could expand the operable size of the class to almost any number.

Student Orientation to the Course. While not wishing to belabor the obvious, we feel compelled to note the importance of the proper orientation of the student to PSI. In a PSI course that operates with no lectures at all, the students may meet together as a class only one time—on the first day of class. This fact, as well as many other elements of the PSI format, may be unsettling to a number of the students, who have been socialized to function in an educational system that minimizes self-reliance and independence. Not only must students be informed of the full details concerning how the system operates and how to perate effectively within the system, but a positive mental attitude toward the course should be fostered. Consistent with the postulate that learning improves int he presence of positive conditions and consequences, students should understand the theory behind the PSI approach in order that positive feelings about the course may be

generated. Students should be encouraged to express their feelings about the course to the instructor and to the tutors at any time. We advise a series of periodic consultations between each student and the instructor in order to monitor and check the academic progress and mental state of mind of the student as he moves through the course. PSI provides the instructor with the capability to engage in a much greater amount of personal interaction with each of his students than can ever be the case in more conventional lecture and discussion course formats.

The Tutorial Session. The tutorial session is the heart of a PSI format. It is here that the student receives personalized attention to *his* needs and *his questions*. The tutorial session is a one-to-one encounter between student and tutor. Even though most tutors and instructors do not fall into the same class as Socrates, such sessions often take the form of a Socratic dialogue in which the tutor leads the student through a cognitive restructuring that promotes new insights and understanding. It is certainly a most exciting educational experience for the tutor (and instructor) to recognize that he is a teacher, in the truest and finest sense of the word.

In any PSI format where tutors are used to grade mastery checks or other evaluation devices, most tutorial sessions will occur in this situation of grading. This is true because most students normally will attempt the mastery check or evaluation device on the basis of their own understanding of the material, prior to seeking tutorial assistance. In the mastery before advancement approach, students are not concerned with low evaluation scores on the first mastery check. Consequently, students commonly use the first mastery check to detect any shortcomings in their mastery of the unit learning objectives.

In this grading/tutorial session, each student receives immediate feedback concerning his responses to the mastery check or evaluation device. Tutors are encouraged to probe the student, especially with respect to responses that may be vague, ambiguous, or unrevealing about the student's understanding of the point in question. Appropriate responses are reinforced. In the case of inappropriate responses, the tutor determines the basis for the student's response, corrects any misunderstanding or misinformation, provides any explanations required by the student, and satisfies himself that the student now understands the material in question. This opportunity for dialogue permits the student to explain, to elaborate, and otherwise to demonstrate his mastery of the objectives. This adds a great deal of flexibility and personalization to the evaluation process.

The opportunity to be tutored in a course can mean the difference between passing and failing for some students. It is not the purpose of the courses that we teach merely to expose the students to certain information and experiences. We desire our students to learn

information and skills, as well as to experience, and to demonstrate certain competencies. Moreover, we believe that the content of our courses are of such importance, that we are unwilling to write off any student as a "failure" without attempting to provide him some personal understanding, attention, and assistance. With a PSI tutorial type format, a student normally can receive as much attention as he needs in order to reach a minimum competency level. Most tutors are devoted to their duty and willingly spend as much time as necessary to help the student who needs it.

We have been quite pleased by the beneficial academic and personal transactions that characterize most student/tutor transactions. Careful recruitment and training of tutors is certainly a crucial factor in attaining such beneficial results. However, it is wise to remember that the tutors have distinct limitations concerning their own comprehension of the course material. Students should be cautioned not to expect tutors to demonstrate the proficiency and depth of understanding in the course material as that of the instructor. Neither students nor tutors should hesitate to consult other tutors or the instructor in order to clarify any uncertainty. In general, tutors are able to establish their own status quite effectively, a status that combines authority and competence with peer group empathy and acceptance. Students who are unable to accept the authority of the tutors normally can be handled by the instructor.

Pacing. A key feature of the Keller PSI format is the opportunity for the student to work at his own pace in progressing through the units. In reality, however, the length of the term (semester, quarter, etc.) can establish some time constraints on the student's ability to work at *his* own pace. Keller (1967:22-23) apparently operated his PSI courses under a rather liberal policy of administering "incompletes" that extended the period of time over which the student could complete all of the units. Thus, Keller's technique is consistent with the PSI principle of self-pacing. We have found it necessary in our courses to require students to complete the course by the end of the term or else withdraw from the course. To permit students to carry over into the course from the previous term strains our capacity to process the number of students requiring the course.

Self-pacing that is constrained by the time limits of the course tends to produce some undesirable effects. The requirement that students complete the course by the end of the term tends to create a higher rate of withdrawal from the course than in a conventional course or in a course in which a liberal policy of "incompletes" is adopted. Many students are unable to exercise the self-discipline necessary to pursue studies in a self-paced format. Work for a self-paced course is often the first to be set aside while the student concentrates on the more immediate needs in his academic or personal life. As the term draws to a

close, these students often find themselves too far behind to complete the course.

A second undesirable effect is perhaps even more serious. Near the end of the term, efforts to complete the material become much more frantic. The failure of some students to pace themselves through the course at a reasonable rate violates the learning principle which recommends spaced learning over massed learning. Whereas some of these students do withdraw, others manage to complete the course, but presumably with a less secure and enduring mastery of the material. Various techniques can be employed to reduce the withdrawal rate in a self-paced format. Some PSI instructors require the student to master at least one or two units within the first two weeks of the term, so that the student will get an early start in the course. Since the first unit or two are normally easier units, this strategy also generates an early positive response and feeling toward the PSI format. It is advisable to provide a recommended schedule for unit completion to guide the student toward a successful completion of the course. Instructors also may hold conferences with students who are lagging behind in an effort to determine whether any assistance can be rendered to the student to stimulate progress in the course. Finally, additional times may be scheduled at which tutorial sessions and mastery checks are available.

Spaced learning and self-pacing are frequently incompatible principles in the practical implementation of most PSI self-paced courses. We presented earlier a course format which was instructor-paced (Figure 3). Our example presented a strict time schedule with limited opportunities for evaluation and no requirement for mastery before advancement. In addition to reducing the withdrawal rate and spacing the material across the school term, this rigid pacing procedure offers certain administrative advantages. Principle among these is that all students take the same evaluation device at the same time rather than being spread out along several different units.

Other instructor-paced formats are available, some of which need not sacrifice the principle of mastery before advancement. Recall the approach by Semb that makes used of incentives, such as point additions or reductions, for the completion of given amounts of work by specified periods of time, mastery being required. One difficulty with this approach is the apparent inequity of students receiving different grades who have completed, by the end of the term, the same amount of work with the same quality level, the different grade resulting purely from bonus or demerit points. We currently are employing a minimum class pace program with the option to proceed at a faster self-pace, mastery not required. The student may proceed at his own pace only as long as it is not less than the minimum class pace.

Self-pacing can be a powerful incentive and reinforcer in the PSI course. It probably appears more often than any other single feature in the positive evaluations of the course by the students (Kulik, Kulik, and

Charmichael, 1974:380). For most students, it is the first time that they have been able to determine for themselves how they best can use their own time, when they can study and take tests most effectively. Nevertheless, it appears that some instructor-pacing strategy is desirable to reduce withdrawals and promote spaced learning. The use of instructor-pacing may create some difficulties in using a mastery-before-advancement approach, especially if the opportunities for administering or taking evaluation devices are limited. At least the instructor should be aware of potential conflicts that might arise in the effort to implement a PSI format.

Unit Evaluation. The unit evaluation may take any form that permits an evaluation of the student's mastery of the learning objectives. Certain PSI principles, however, do place some constraints on the type of evaluation most often used. Recall that three of the PSI principles were: 1) the organization of material into several units that cover a relatively small amount of material; 2) frequent evaluation; and, 3) immediate feedback. These three principles emphasize the use of evaluation devices that require relatively little time for the student to complete and that can be evaluated by the tutor or instructor in a relatively short amount of time.

Short examinations usually fulfill these criteria without necessarily confining the instructor to testing only lower level cognitive skills. Ideally, such quizzes are designed so that they can be taken in less than thirty minutes and graded very quickly by a tutor. They usually contain fill-ins, true/false, short answer, short essay, multiple choice, or certain problem-solving types of test items. The taxonomies of educational objectives devote considerable space to the discussion of testing and evaluating the attainment of the various objectives. If short quizzes are used, multiple alternative quizzes testing the same objectives will be required for any unit mastery approach. In such a format, three quiz forms over the same unit may suffice. If a student is unable to master the unit objectives by his third quiz attempt, a concentrated effort should be made to determine the source of his difficulty, and it should be remedied. The instructor may then administer an *ad hoc* oral quiz, let the student re-take an earlier quiz, or simply construct a fourth form of the quiz to administer. We recommend that a rotation of test forms be exercised in administering the quizzes in any PSI format in which students do not all take the same quiz at the same time. Such rotation minimizes the utility to the students of acquiring and memorizing the appropriate answers to a quiz. Records must be kept on each student that identify which form of a unit mastery check has been administered to the student and whether or not he passed it.

In addition to the unit evaluations, Keller (1967:6) recommends that review checks be conducted periodically throughout the course. These reviews may be incorporated into a unit evaluation device for par-

ticular units or may be administered separately. If administered separately, reviews may be treated just like any other unit evaluation device, or they may be given special status. Some PSI instructors use the reviews as the only graded evaluation in the course. Others may not have reviews affect the grade or rate of progress at all. Still others may ignore reviews altogether. Obviously, their use is quite flexible. The purpose of the reviews is to provide additional reinforcement to the appropriate mastery of material already covered. Reviews also promote the longer retention of what was learned earlier.

Two different evaluation techniques were presented in Figures 2 and 3: unit mastery before advancement and graded unit evaluation without mastery before advancement. PSI instructors differ with respect to defining the term "mastery." Some require a mastery check with no errors; others permit some error, such as 90% of a unit mastery quiz. Those who achieve the prescribed mastery level are permitted to proceed to the next unit, while those who fall short must try again. The term "mastery" can apply loosely to any minimum performance level that is required in order to advance to the next part of the course (e.g., 70% mastery). However, if one is going to use a mastery level below 90%, perhaps the term "performance level" should be substituted for "mastery." The mastery performance level selected by the instructor is based upon the objectives, necessities, and realities of the particular course under consideration.

Unit mastery appears to be preferable to non-mastery on the basis that it promotes a more thorough understanding and longer retention of the material. Unit mastery is especially desirable whenever each unit builds upon information, skills, or experiences presented in prior units. Nevertheless, the pedagogical preference for mastery may not always be the most practical technique. In the previous section on pacing, it was noted that instructor-pacing may limit the capability of utilizing a unit mastery approach. Unit mastery works best in a self-paced format, since the student may need more time to master one unit than another. Instructor-pacing may not provide the time needed for some students to finish. Instructor incentive-pacing that utilizes a bonus or demerit point system offers the possibility of encouraging a sufficient pace to finish the course while still accomodating a unit mastery approach.

The graded evaluation advancement-without-mastery may be conceptualized as abandoning individual unit mastery requirements while retaining a variable course-mastery evaluation. No minimum performance level is required for any individual unit, but course grades are based on an average unit evaluation grade, perhaps along with review tests and/or a final exam. Thus, a student may not need to attain a grade of 75% on a unit quiz in order to advance to the next unit, but he may need to average a 75% over all of his unit quizes in order to get a "C" grade.

In simple terms, the choice facing the PSI instructor is one of

adopting or not adopting a minimal unit performance level. But the number of options and varieties of evaluation schemes complicate this choice considerably.

Grading Schemes. In a PSI course that requires unit mastery, two general types of course grading criteria can be identified (Wilson and Tosti, 1972:103). The final course grade can be based strictly upon the amount of work completed. In this scheme, a grade of "A" is obtained upon the successful mastery of a given number of units. Lesser grades are based upon the completion of successively fewer numbers of units. (In a "credit/no credit" system, then, a certain number of units is specified in order to obtain a "credit.") The opposite of this technique is to require all students to master successfully the same number of units, and then to base the course grade on some type of graded (or "credit/no credit") comprehensive final evaluation. A variation of this latter technique is to use graded evaluations interspersed throughout the course (along with or even without a final comprehensive evaluation) just as in a more conventional course. Everyone still completes the same number of units, but course grades are based upon the graded evaluations.

Figure. 5. Two PSI Grading Schemes

Unit Mastery Grading Scheme

Grade	Requirement
E	Less than 11 units mastered
D	11 units mastered
C	13 units mastered
B	15 units mastered + 75% on comprehensive final
A	16 units mastered + 85% on comprehensive final

Unit-Graded Non-Mastery Grading Scheme

Grade	Requirement
E	Below 60%
D	60-69%
C	70-79%
B	80-89%
A	90% or above

As many as two quizzes may be taken over a single unit. Only the better of the two quizzes will count toward the course grade. A single comprehensive final exam is required of all students. It may count either 60% or 20% toward the course grade.

Neither of these schemes appeals to us, and we recommend a composite of the two. One grading scheme we have used is presented in Figure 5. In this scheme, a student can obtain up to a grade of "C" strictly on the basis of the number of units completed, that is, without taking a comprehensive final. The number of units required for the "C" is based on our consideration of what constitutes the "minimum essentials" for the "C" student to know. For a grade of "B" or "A" we feel more strongly that evidence of retention and synthesis of the course material is an important consideration. The comprehensive final permits a check for such evidence. A difficulty with this sytem is that some element of risk faces the student who successfully masters the additional units, but fails to achieve the specified criteria on the comprehensive final. For example, the student who completes 15 units but scores lower than 80% on his comprehensive final receives a grade of "C". In fact, a grade of "C" also is assigned to the student who completes all of the units but scores less than 70% on the comprehnsive final. To place so much emphasis on the final comprehensive seems somewhat inconsistent with the philosophy of multiple unit quiz opportunities to attain mastery. PSI should accent the positive and stress the opportunity to enhance learning with multiple opportunities to achieve the instructional objectives. A second opportunity to take a final comprehensive is consistent with this philosophy, although consideration might be given to raising the minimum performance level this second time around.

In the non-mastery graded units approach shown in Figure 5 the more conventional grading system is evident. All students complete the same number of units. The grades from these unit quizzes average together. Any review checks or a final comprehensive can figure into the grading according to any weighting scheme desired by the instructor. The example in Figure 5 utilizes a variable weighting scheme for the final.

In the instructor incentive-pacing approach of Semb and his associates, course grades are based upon points awarded for mastering a unit, scores on review tests, a final exam grade and points added for completing units by a specified time in one approach or points deducted for falling behind the pace in another approach. There are several techniques for assigning bonus or demerit points. Semb deducts points for each day a student is below the minimum pace. The more positive flip side of that coin is to give bonus points for completing units by a specified time. This latter approach seems more consistent with the principle of positive conditions and consequences. It was noted earlier that this system has the potential for assigning students different grades decided only on the basis of the bonus or demerit points, despite the fact that the same amount and quality of work might have been performed.

Despite the difficulties in securing valid, fair, and equitable grading

systems, the instructor can rest assured that PSI approaches tend to produce a higher quality output than more conventional courses. In general, the students in a PSI course receive the highest grade that they could possibly receive in the same course taught by any other technique, not, of course, because of easier grading, but because of the improved learning facilitated by PSI.

Role of the Instructor. The role that we set for a PSI instructor is both demanding and different from that of a conventional teaching role. The instructor is no longer primarily a disseminator of information and evaluator of student performance. He becomes a goal setter, test constructor, prescriber, motivator, resource person, administrator, tutor—a facilitator of learning. He participates in the course as one of the tutors, and students may come to him or any of the other tutors.[2] He also supervises the tutors and resolves any conflicts which cannot be handled by the tutors. Foremost among the concerns of the instructor is the creation and maintenance of positive conditions and consequences of student contact with course materials and tutors. Through individualized student contact, the instructor is able to promote the student's tendency to inquire on his own and to foster in the student a favorable self-image of himself, his abilities, his creativity, and his uniqueness. For the instructor, the amount of time spent on the course normally is equal to or greater than that spent on the conventional course. However, in the PSI course much more time is devoted to interaction with individual students and to the actual teaching of students through the tutorial sessions. For most instructors, this is a very rewarding experience.

Evaluation of PSI Courses

Efforts at evaluating the effectiveness of PSI approaches and student receptivity to PSI have begun to appear only recently in professional publications. The evaluation of teaching techniques is quite susceptible to a variety of methodological problems (see Campbell and Stanley, 1963). The comparison between PSI and other teaching techniques is complicated further by the fact that the resource materials used in the PSI courses frequently differ from those used in other techniques. Despite these problems, however, enough evidence has been gathered to make at least some initial evaluations of PSI in general, and close variations of the Keller PSI format in particular.

We are aware of two papers which have surveyed the literature for such evaluative research (Kulik, Kulik, and Charmichael, 1974:382; Reiser, 1974). They concur in reporting a consensus that PSI students perform better on all types of examinations. PSI students also demonstrate longer retention of material than students in more conventional courses. Grade distributions in PSI courses reveal a much

larger proportion of higher grades, despite controls for grading criteria. Summarizing their review of the research, James Kulik and his colleagues reported that 11 of the 15 evaluative research articles they examined confirmed the superior performance of PSI students. The other four studies found no statistically significant differences between the Keller format and the control course. Furthermore, of the five studies judged to be especially methodologically and analytically sound, all five reported the superiority of the Keller format.

Not only do PSI courses demonstrate greater effectiveness in the cognitive development of students, but student responses in the affective domain are very positive toward the PSI approach. Particularly favorable expressions are directed toward the self-pacing feature of PSI, the self-determination of study and test schedules, and the personalization aspect of interaction with the tutors and instructor. The comparison of the PSI approach to more conventional techniques invariably results in the more favorable rating of PSI by most students.

PSI has been viewed negatively by some educators because of its perceived reliance upon certain Skinnerian conditioning formulations. This attitude, however, overlooks the conditioning nature of education, regardless of the type of instructional technique utilized. The undesirable conditioning effects of our educational system have been a favorite subject for many authors of popular educational philosophy books. For example, one type of behavior likely to be reinforced in a conventional lecture class is that of passivity, the student becomes dependent upon the instructor as the dispenser of knowledge and information while the student is the passive recipient. We believe that PSI can foster desirable intellectual and personal traits in students. Students in a PSI format are trained to take responsibility for their own educational development. In PSI, students are challenged to think, to reason, to articulate thoughts, and to master the understanding of material much more than is likely in a more conventional setting. Tutorial sessions encourage in the students a willingness to seek out other opinions and be less defensive about their own opinions. The tutorials also enhance the development of higher cognitive skills, such as skills of analysis and evaluation.

Although we have touted highly the advantages and benefits of PSI, there are certain distinct disadvantages that diminish its effectiveness (see Wilson and Tosti, 1972). Certain disadvantages have been noted throughout the paper, for example: a tendency for the number of students who drop the course to increase in the self-paced approach and initial student apprehension about the technique. Any PSI system is a complicated one with many components that require proper implementation in order to achieve maximum effectiveness. Defects in any of these components can short-circuit the system. For example, the quality of tutors must remain high; the construction of so many unit evaluation devices, normally quizzes, creates problems of validity and

reliability; the resource materials assume a more important role than in conventional courses; the proper physical facilities are important; and the student/tutor ratio should not exceed a certain level. Some potential PSI instructors might regard the great amount of advanced preparation for such a course as a distinct disadvantage.

The potential applications of PSI have not yet been defined. Some critics argue that PSI is limited only to those courses which have a highly organized subject matter and which emphasize lower cognitive and psychomotor levels of learning. This is not true with respect to our own courses, which involve considerable application, analysis, and evaluation. We believe that the PSI principles are relevant to almost any kind of learning. We are confident that innovative and industrious instructors can develop PSI formats for a wide variety of courses, ranging from statistics and American Government to political philosophy, from whence it originates.

NOTES

[1] Keller specifies five features which distinguish his PSI approach from more conventional teaching approaches. Four of those are applicable to the format in Figure 2: self-pacing; unit mastery before advancement; student tutors; and the emphasis upon written material for conveying information to the students. Keller does utilize lectures, but he specifies as the fifth feature of his approach the " . . . use of lectures and demonstrations as vehicles of motivation, rather than sources of critical information" (Keller, 1967:9-10).

[2] Keller (1967) does not utilize the course instructor as a tutor. He concedes the consequent lack of interaction between students and instructor as an undesirable aspect of his system. The use of the instructor as one of the tutors is a key feature for the most advantageous implementation of any of the formats that we have suggested. If the number of students in the course can be limited, even to sixty or seventy, then the instructor can interact with *more* students *more* frequently than in a conventional classroom.

References

BLOOM, B.A. (ed.), *et al.* (1956), Taxonomy of Educational Objectives: Cognitive Domain. New York: David McKay Co.

CAMPBELL, D.T. and J.C. STANLEY (1963), Experimental and Quasi-Experimental Designs for Research. Chicago: Rand McNally.

CARR, W.J. (1962), "A Review of the Literature of Certain Aspects of Automated Instruction," in W. Smith and J.W. Moore (eds.), Programmed Learning. Princeton: D. Van Nostrand.

GRONLUND, N.E. (1970), Stating Behavioral Objectives for Classroom Instruction. New York: The MacMillan Company.

KELLER, F.S. (1967), "Neglected Rewards in the Educational Process" (paper read at the American Conference of Academic Deans, January, 1967, in Los Angeles).

KELLER, F.S. (1968), "Goodbye, Teacher . . ." Journal of Applied Behavior Analysis. 1, 1:79-89.

KEMP, J. (1971), Instructional Design. Belmont: Fearon Publishers.

KIBLER, R., L. BARKER, and D. MILES (1970), Behavioral Objectives and Instruction. Boston: Allyn and Bacon.

KRATHWOHL, D.R. *et al.* (1964), Taxonomy of Educational Objectives: Affective Domain. New York: David McKay Co.

KULIK, J.A., C.L. KULIK, and K. CHARMICHAEL (1974), "The Keller Plan in Science Teaching." Science. 183, 379-383.

MAGER, R. (1962), Preparing Instructional Objectives. Belmont: Fearon Publishers.

MAGER, R. (1968), Developing Attitudes Toward Learning. Belmont: Fearon Publishers.

MAGER, R. (1972), Goal Analysis. Belmont: Fearon Publishers.

MCASHAN, H.H. (1970), Writing Behavioral Objectives. New York: Harper and Row.

POPHAM, W.J. and E. BARKER (1970), Establishing Instructional Goals. Englewoods Cliffs: Prentice-Hall.

REISER, BOB (1974), "Contingency Managed Instruction." Mimeograph, Department of Educational Technology, Arizona State University

SEMB, G. *et al.*, "An Experimental Comparison of Four Pacing Contingencies In A Personalized Instruction Course". Mimeograph, Department of Human Development, University of Kansas.

WILSON, S.R. and TOLSTI, D.T. (1972), Learning is Getting Easier. Individual Learning Systems.

Teaching Political Science By The Personalized System of Instruction

Ralph B. Earle, Jr.

Introduction

The preceding papers by Robert Ruskin and by George Watson and Dickinson McGaw have set forth the basic concepts of the Personalized System of Instruction and of how to put PSI into practice. This paper will report the experience of one application of PSI, to an introductory course on the American political process, at one place and time, the Massachusetts Institute of Technology during the spring of 1972, and it will discuss at some length the specific issues which must be addressed before any broader judgment can be made about the relevance of PSI to the teaching of political science.

The use of PSI to teach the course "Introduction to the American Political Process" was within a quasi-experimental setting. The course (also known by its catalog number "17.21") was taught in two sections, one by the lecture/discussion method by a Senior Lecturer who had taught the course for several years previous, the other by the author and a graduate teaching assistant* who had taught the course once previously in the lecture/discussion format. Both sections contained 17 students. The lecture/discussion students met for two hours each week; the PSI students took unit tests during a total of seven open class hours per week. Both sections took a common final examination and both sections wrote term papers.

According to student self-reports, the PSI section required significantly more preparation time than did the lecture/discussion section (9.4 hrs/week vs. 5.4 hrs/week). The PSI students felt they learned more in the course compared with other non-science and non-engineering courses than the lecture/discussion students felt they learned. Both sections reported the same level of personal enjoyment of the course. The results of the final examinations and term papers were inconclusive as to which was the better teaching method, in terms of those criteria.

This paper, however, is not concerned so much with the experience as an experiment *per se* as with what the experience revealed about the combination of PSI and political science. To explore this topic, it will help to fill out the picture of how the PSI section was conducted, so that it can be placed in the context provided by the two preceding papers.

The PSI section began with nineteen students, of which seventeen remained enrolled for the entire semester. The testing format was very similar to that described by Watson and McGaw. After the initial class meeting of the semester, the class hours were open for test-taking for the scheduled three hours per week, but a mutual convenience of the instructors' time and some of the students' schedules led to an additional four hours of test-taking time becoming available. The most important points about the testing as we conducted it were the fact that the questions were almost all essay-type, instead of multiple-choice or short-answer, and the fact that we cross-examined the students when-

*Donald L. Dickson, now Assistant Professor of Political Science, Middlebury College, Middlebury, Vermont.

ever their written responses appeared to be inadequate. "Cross-examination" has negative overtones, but, often, it was merely the means by which we cleared up some confusion in our own minds as to whether the students really had mastered the unit, since their ability to express themselves in writing did not always equal their true understanding of the material.

The course material was essentially carried over from the previous semester's syllabus. Its underlying theme was the question of what an individual could do to affect the American political process if he or she felt that it was not operating to his or her benefit. The first six units were of a somewhat theoretical nature, covering the topics of the political sociology of political science itself, the cultural parameters within which the system operates, the role of public opinion, parties and voting behavior, elites, and group theory. The last half of the course covered the more traditional topics, such as the Presidency, the Congress, the Courts, the race issue, and the then-upcoming Presidential election. The units themselves will give a better flavor of the course than this brief description; the role of the introduction in helping the student understand what we considered to be important about a particular topic can be better appreciated, as can the style and tone of the questions. Also included with the units is the course outline which introduced the PSI method (or "Keller Plan," as we called it then) to the students. It would probably be helpful in understanding the discussion which follows if you, the reader, skimmed over one or two of the units contained in the appendices.

Strengths and Weaknesses of the PSI Method, as perceived by the Students

The papers by Ruskin and Watson and McGaw set forth the supposed virtues of the PSI method—better learning, decreased anxiety, increased feelings of accomplishment, independence—but things do not always work out as advertised. This paper's consideration of the relative merits of PSI applied to political science begins, then, with a review of how the students themselves viewed their experience in 17.21. Here are their appraisals, *verbatim:*

STRENGTHS

Relief of anxiety
More continuity of presentation
Gets students to do the readings
Chance to talk individually with the instructor about the material
Clear outline of what is expected
Eradication of "hidden curriculum"
Personalized discussion and contact with T.A.'s
Openness, honesty of method—no tricks

Direct communication with instructors

You have to read everything

Lots of information can be crammed in

For weak-willed students who want to learn the material but want to do as little work as possible, this gives them an excuse to do the work

Cross-examination forces student to read more than superficially

Specific goals

Guaranteed grade for the work done

See what we have learned

Self-pacing allows manipulation of course load around work load in other courses

Makes one read everything and learn all important points

Don't have to listen to uninteresting discussions or biased teachers—if readings are well chosen, there will be less bias

Because the material must be memorized for use in the unit tests, it can be used in regular discussions on politics. That seems, at least for me, to have made discussions on this year's election much more interesting.

This list of PSI virtues reads as though it had been drawn up by active PSI public relations people. Apparently, the students saw PSI's strengths as they have been proclaimed, and there seems to have been a wide variety of positive points. Now, let us turn to the reported weaknesses of the method:

WEAKNESSES

Lack of class discussion

More work than a standard course

I realized toward the end that I didn't get to know a single other student in the section—I know only 3 or 4 by name

Too many exams, the pressure to do one a week

Too much structure

No contact with the other members of the class

Need to memorize lists of things before tests

Arguing with Don and Ralph over trivialities

Too many questions that one has to memorize answers to

Maybe a lack of communication—some class discusssions can be worthwhile—but I suppose it's a price to pay

I felt that the lack of discussion was a weakness. After reading the material, I know there were things I misunderstood which were not tested. Discussion might have reduced the amount misunderstood.

Really did not encourage thought, was primarily a feedback operation

Time excessive

No discussion on more than a one-to-one basis

Several of the criticisms relate to the testing procedure; these will be considered at some length, below. The others will be discussed now.

Four of the students missed class discussion. This was expected at the outset; we thought that some students would enjoy interacting with their classmates and therefore feel its absence under the PSI method. Other students, we felt, find class discussions boring, or a waste of time, or merely a chance for those who have nothing to say to say it. What we did not anticipate was the fact that students would miss the social aspect of class discussion, the opportunity to meet their fellow students and develop friendships.

The Personalized System of Instruction does not provide this social opportunity in any form, and, assuming that a university education consists of more than curriculum study—that one of its major purposes is the fostering of personal growth and maturation in its students—one must conclude that this weakness of the PSI method can be important for some students. This may be particularly so in the social sciences, which appear to be more inter-person collaborative when compared with the common view of the physical scientist, alone, or nearly so, in the laboratory. To the extent that social science deals with human interaction, to deprive students of that experience may be to impede the development of their powers of observation, tolerance and understanding of human behavior.

And this points up an important difference between the two methods. A student in a lecture/discussion section can drum up support for dissent from a particular point of view, and the incentives for critiquing an author or instructor may be higher with an audience. By contrast, the PSI method provides no audience but the instructor, or, perhaps, the line of other students waiting to have their tests graded, and the dissenting student has no way of immediately knowing whether he or she is a minority of one or a member of a majority on the point. About the only way in which the PSI method could offer the student an option in this regard would be to develop over time alternative units on the same topic, expressing different political values, and allowing the students to choose which one they wanted. This option, however, could lead to students' choosing only those political views with which they identified, thus denying them the potential for awareness of other points of view and the enlargement of personal vision which this might afford.

One student who felt the absence of class discussion recommended that the unit testing be conducted by the students themselves, leaving the instructor(s) to act as consultant(s) on special problems. Having students test one another is a common variation on the PSI method. This can be done in either of two ways: the instructor can test the first students who take the first unit test and then have them test the later students; or, the instructor can recruit former PSI students, if they exist, to serve as examiners.

The first, "bootstrapping," process has the drawbacks of the fact that since the first tests would be given by the instructor, students might not

want to be first, hoping to get a fellow student, perhaps more lenient, grader later on, and of the fact that the instructor would have to rely on the students to take the responsibility for arranging their schedules so as to be able to test one another and to carry out this responsibility. In practice, the instructor would probably spend more time overseeing this process and stepping in to substitute for missing testing appointments than he or she would save by using students as testers.

The second alternative clearly depends upon the existence of students who have already taken the PSI section of the course, which puts us back on square one, as far as getting the first class going is concerned. And it would require some sort of payment to these "veterans"—either in money, which raises the cost of the teaching method appreciably, in credit hours, which may not be an attractive incentive to every student and which may require administative policy decisions novel to the institution. As to the question of increased cost due to the payment of student assistants, one should point out that in the case of extremely large course enrollment—in the hundreds, say—the cost of a senior faculty member, directing graduate teaching assistants, who, in turn, monitor the individual sections, might easily cost less in instructor salaries and wages than, say, a mix of two faculty and four teaching assistants per 100 students. Such large-scale applications of the PSI method have been reported, but in the context assumed here in this paper of fairly small student enrollment (50 or less) the cost savings suggested by the large-scale scenario will probably not be possible.

Two comments were made on the amount of time needed for course preparation,excessive for those two students. The units did contain a lot of required reading and many questions to which the answers consisted of many parts, which meant that some students felt forced to memorize lists of answers. Were either of us to give the course again, we would reduce the amount of material and narrow the scope of some of the questions. The excessive time demand is not a function completely of the method, therefore. It is probably true that, for a given reading, the PSI method requires more attention to specific detail than does the lecture/discussion method, because the PSI method charges the student with learning the material on his or her own, while the lecture/discussion method implicitly offers the student the opportunity to determine just what is important in the reading by listening to the lecturer's points of emphasis. Still, ten of the seventeen students in the PSI section did complete all the units and another four fell only one shy. The point is that the PSI method can require only as much preparation time as the lecture/discussion method, if the PSI instructor is willing to have the students cover less material, but learn it well. This may appear to be an unpleasant trade-off, but one should keep in mind that the PSI method almost "guarantees" learning of the unit material, while the lecture/discussion method is not nearly so predictable in its effect. A

student who completes all the units in a PSI course really has learned the material; a student who has done all the readings and attended all the classes in a lecture/discussion course may not have.

Unit Testing. From a learning psychology point of view, the basic purposes of unit testing in PSI are to give the students a chance to demonstrate that they have learned what they have been told they must and to reinforce them positively and immediately for having done so (or negatively, if they have not). Note the phrase, ". . . what they have been told they must." The PSI method, for all the freedom it allows the student in choosing when he or she will study, nevertheless remains in complete control of the material to be mastered.

At first blush, this fact may seem inconsistent with the value implicitly placed on the student by the word "Personalized" in PSI. But it does seem that within each discipline—physics, chemistry, mathematics, psychology, political science—there are fundamentals which must be apprehended before a student can understand the body of phenomena and the methodology with which the discipline is concerned. Once someone has decided that certain facts, theories, processes, equations, data, *etc.* must be learned, then PSI offers a method for learning them. But someone has to make that decision of essentiality.

This requirements imposed by PSI came home quite forcefully to the two instructors in 17.21. The previous semester's syllabus has included a section on the Pentagon Papers, and we simply assumed that the PSI section would as well. But when it came time for us to specify exactly what we wanted the students to learn from the Papers, we were at a loss to do so. The details of the history of the Vietnamese War seemed ancillary; we were not about to ask, "Who was assasinated in 1964?" or even "What was the significance of Diem's assassination?" The former was asking for a piece of information trivial in isolation and the latter was either too broad or too narrow, depending upon how far one wanted to stand back from the fighting. Ultimately we realized that the significance of the Pentagon Papers to us, the instructors, was something which our students, who averaged about 20 years of age, could not appreciate: the whole historical setting of the Cold War requiring that otherwise "liberal" Democratic Administrations had to be just as "tough" on Communism as they expected "conservative" Republic administrations would have been and the Pentagon Papers revealing that it had been the "good guys" who had led the United States into this war. This disillusionment, we felt, could not be shared by young people who had never been "illusioned" in the first place. To contruct a unit on the Pentagon Papers alone would have been to rob them of the context which made them meaningful to us. To supply that context would have required an entire semester's course in post-World War II American foreign policy. The point here is that, were we not required by the PSI method to state explicitly what about the Papers we wanted the

students to learn, we would not have been forced to come to grips with this difference of salience for them and for us. Here is where a lecture would supplement the course well by providing the context for the papers.

A related phenomenon recurred throughout our construction of the units. Time after time, the question, "What is really important in this reading?" challenged our easy assumption that a particular author was worth assigning because he or she was well known in political science. No particular author fared exceptionally ill or well under this exacting test, so it would be beside the point to list examples of where Lane or Lowi or Lockard or Lewis failed to say something in a way in which it could be pinned down precisely, so that the students could learn it precisely. The consideration to be kept in mind is that in political science, where propositions with the exactitude of $F=ma$ do not exist, applying the PSI method is going to require some hard decisions as to just what elements of an author's assertions or findings are essential to an understanding of a particular field in the discipline. Making these choices in the course of devising units is a very revealing process, not only about a particular scholar, but also about a teacher's assumptions and prejudices about the state of the knowledge in the field.

Looking at unit testing from the standpoint of the students, we wanted unit questions which had a high degree of face validity, questions which the students could tell simply by reading them were worth our asking because they clearly covered important points. Obviously, they would not be highly motivated to find the answers to uninteresting questions. Most important, the questions had to be ones which the students themselves could tell they had the correct answers to *before* they came in for testing; otherwise, test anxiety would not be relieved. For example, a poor question is:

"What are the most important powers of the President?"

How can a student know when he or she knows the answer? Only somewhat better is:

"What are the three most important powers of the President?"

At least now the student can stop at three, but "most important" according to whom? The question should read:

"What does James MacGregor Burns say are the three most important powers of the President?
What is his evidence for these three? Do you agree? Why?"

Note, however, that the instructor who wrote this question would have to have made the value judgment that this particular fact—what Burns thinks—is "important," for some reason or another. Here is where the teacher learns about his or her own opinions as well!

The Instructor's Point of View

In addition to the author, the PSI section of the introductory American political science course was taught by a graduate assistant who had taught the same course with essentially the same syllabus the previous semester. In order to be able to assess the PSI method as applied to political science from the instructor's point of view, he was asked to comment on his experience with the method, particularly focussing on three points: the effect of the absence of class discussion; the degree of satisfactoriness of the personal contact with the students during unit testing, especially the degree to which it might compensate for the absence of class discussion; and, the major differences in the two methods as they relate to the teaching of political science.

His appraisal of the PSI method reflects the fact that, of the two of us, his concern with the course was more focussed on the substantive issues of the discipline, while the author's main interest was with the teaching method itself. The phrasing of the questions directed to him was made as open-ended and non-prejudicial as the above concerns would allow. Here are his comments, recorded nearly one year after the course was given.

"When you start full-time teaching, will you use the Keller Plan?"

"It would depend on the kind of students. When you have students with a great range of exposure to political phenomena, it's very hard to get a critical mass going for discussion, because they don't interact with each other, they just interact one-to-one with the instructor. Everybody else sits and listens to a discussion either above their heads or below their heads. That you certainly get at M.I.T. at this particular time, when there have been all the radical actions for a couple of years.

"In the fall section I had a farm kid from South Dakota, a freshman, and a junior, a three-year S.D.S. letterman who had been through all the big campaigns. He could educate me about the capitalist investment insuring something like the Vietnam War, and the South Dakota man and I—I wish I could remember some of the really basic words he asked me to define. Those two had nothing to say to each other.

"Then there was a Massachusetts Conservative Party ideologue, and an Army 'brat' and an A.I.D. 'brat' who both had their inside view of government and foreign countries. There was just no way any of those people could talk to each other. It was very frustrating.

"I think the Keller Plan would have been great for that situation, except the S.D.S. guy wouldn't have taken it. He probably would have dropped out; he wanted a more free-wheeling debate sort of situation.

"I think the Keller Plan is also well-adapted to M.I.T. students from another point of view, namely, that many of them are so woefully underdeveloped as far as discussing public events are concerned, or discussing any kind of nebulous humanistic phenomenon that isn't quantifiable. So that's another reason why they wouldn't be comfortable in the class-discussion format, because most of them wouldn't say anything."

Two aspects of the PSI method of instruction are relevant here. First, by the very virtue of its being *personalized, PSI quickly makes the*

instructor aware of any differences in political sophistication and interest; the instructor can adjust his level of response accordingly. The disparities indicated above are not necessarily present at all undergraduate institutions, and they were not prevalent to the same degree in the PSI section, but there were noticeable differences among the students, with the most divergence being represented by a 40-year-old Army supply sergeant and an architecture student who had only very recently begun to learn to express himself in writing. Had we conducted a lecture discussion section with the PSI students, we would have had to take these men into account, while trying not to lose the interest of two other students who were relatively sophisticated in social science, if not knowledgable in political science. Also, in an introductory course, one often finds potential political science majors alongside students who are looking only for an interesting, "timely" course or perhaps to fulfill a humanities/social science distribution requirement. In this situation an instructor's energies can easily be divided between furthering the interest in and making the discipline exciting to the potential majors while not neglecting students with a less central interest.

The second aspect which bears on the situation where students enter the classroom with widely varying amounts of factual information in the area of the course is the fact that *the PSI method does not leave the less knowledgable or sophisticated student behind.* Within the broad limits set by the length of the semester, the less capable or interested student does not have to "keep up" with the remainder of the class, both in terms of pace and subject matter. For, although this variation was not used in this study, there is no reason why a PSI course cannot contain a "menu" of study guides from which the student may choose. It would take time to develop these guides to a sufficient number to allow a decent choice, but an instructor who gave a PSI section over a number of semesters could accumulate such a menu, particularly in view of the fact that the basic curriculum units would result from the first semester the course was given. While the philosophy of the PSI method does not allow a student to learn "a little bit about everything"—remember that it requires *mastery* of any given unit—it can limit itself to requiring that the student master only those topics in which he or she is interested. Or, should this freedom of choice sound too permissive, an instructor can require the mix of compulsory and elective units as he or she feels is best, given the content area of the course.

"What are your feelings about the lack of class discussion from the instructor's point of view?"

"In order to bring off a good discussion, you have to be a fairly good teacher, whereas, with the Keller Plan, you can get away with considerably less skill and experience. It's good for a real greenhorn, like us, because there is a body of material which both you and the students have in front of you, and you don't have to get too far afield from it. Whereas to bring together an hour or two's

free-wheeling discussion about budgets and Constitutional crises might be hard for a first-year lecturer to do. You *could*, obviously, if you went into a great deal of preparation, or if you've been around long enough. Also, the ability to conduct a group discussion is a specialized skill, which is not born in many of us, like knowing when to cut off some lunatic, when to change the subject, how to cast about for a topic which appeals to people."

"It's good for a real greenhorn, like us" is a point well-taken. The graduate assistant had spent an average of 16 hours preparing his lectures the previous semester when he taught essentially the same syllabus by the lecture/discussion method. Since he was therefore familiar with the course content, the five hours a week he spent preparing a week's PSI unit is certainly a smaller number than if he had had to generate both the syllabus and units from scratch. Nevertheless, it is highly unlikely that the time to prepare previously unfamiliar material in unit form would be anywhere near the 16 hours required by the lectures. As a note of comparison, the author was unfamiliar with much of the specific readings which went into the units; he found, however, that a unit took about six hours to prepare, *including the time needed to read the assigned material for the unit.* (The implicit discrepancy between the two instructors' preparation times results from the fact that unit-preparation was not new to the author, but it was new to the graduate teaching assistant.)

As to the point that conducting a discussion class is clearly a skill, it is certainly true that, with the PSI method, one never gets any conducting practice. And it is unlikely that any instructor, green or ripe, would be willing to forego forever the challenge of learning to do so. Later, below, we shall consider possible modifications to the PSI method which would fit it more closely to the requirements of teaching introductory political science.

"What about the personal contact with the students under the Keller Plan?"

"In general, the individual contact with the students was much better this way. You got to know many more people much better than you would in a lecture class. I *don't* think you got to know a few people very well, as you often can get in a regular classroom situation. Because, in a regular classroom, some few individuals will take the initiative to come and see you and talk to you about things, and they will also dominate the discussion, so you get to know their social personalities, which you don't in the Keller Plan system. And, especially if they are going to be a political science major and are going to be around for several years and you may want to hire them as a research assistant or write letters of recommendation for them, you may want to get to know them better than you would in the Keller Plan."

Although the actual number of minutes spent per week with each student was certainly less than 15, on the average, both instructors shared the subjective feeling that the interaction during that relatively brief time was very intense, and that it gave us a good feel for where the student was, both politically and intellectually. The graduate teaching assistant's observation that one did not get a sense of their social

personality is his own; the author felt that he came to know the students he tested very well. Both instructors felt they came to know the students well *qua* students, however.

The last part of the graduate assistant's response is a good one. Classrooms are recruiting centers, into the discipline generally and occasionally into the service of the instructor. They are also proving grounds for debate and analytic technique, if they include discussion. And they afford the chance of an instructor's spark setting off an intellectual or emotional fire, if they include a brilliant lecture now and again. Especially in view of the fact that competence in political science is not solely a function of the mastery of certain facts or research techniques, mastery of which might be testable solely by machines, the discussion classroom is an important source of information about a student's abilities in the field, particularly the ability to express himself or herself clearly, to learn from what others have to offer, and to be aware of the role of values in political thought. All of these have to be considered when writing a recommendation for graduate school, say, and even a series of PSI-method encounters with a student might not reveal the full extent of their presence.

"What major differences between the Keller Plan and the lecture discussion method impress you as an instructor?"

"The Keller Plan forces you to think analytically, rather than descriptively. I think in a lecture it's very tempting to describe things, especially in a beginning course where people don't know an awful lot of very obvious facts. And all of this would appeal to an instructor of a certain cast of mind, too. The fact that I enjoy being forced to think analytically—and I see a parallel between this and legal analysis—is a function of my own mental history. I think people with a more historical cast of mind would probably feel confined by this system of teaching."

This distinction, between analytical and descriptive pedagogy, is the essential one in the PSI-lecture/discussion comparison. When you are faced with a classroom full of students new to political science you are very much aware of the probable differences in information and sophistication they bring. The instructor must decide how much time he or she will devote to providing them with the basic facts about a particular topic and how much time he or she will devote to an analysis of those facts. This trade-off is a difficult one, because the depth of analysis is limited by the depth of the facts. Often, one foregoes the analysis one would like to present or stimulate in order to insure that at least most of the students know what is being talked about. And one hopes that some future course will be able to get down to deciding what these facts might mean for these students.

The PSI method forces analysis over description because the mastery of facts outside of an analytical framework soon becomes an exercise in memorization—and nothing with the internal regularity and harmony of the multiplication tables exists in political science.

Memorization is an unrewarding task, as some of the students noted in their responses to the questionnaire, and positive reward is an essential element of the PSI method. The instructor in a PSI course must, therefore, present some sort of analytical framework within which the mastery of facts can take on meaning; this is the purpose of the introduction section of each study unit. But the introductions cannot be written until the instructor has paused to give thought to just how the material in the course is interrelated and therefore thought to what his or her own analytical schema are. Conversely, an instructor more attuned to the history of an issue, more versed in its myriad twists and turns, perhaps because of personal experience in the area, is likely to find the PSI demand too high a price. This distinction also relates to the behavioralist—traditionalist division within political science. The behavioralists are far more likely to find the PSI method in keeping with their approach to the discipline. The traditionalists will not find it congenial to theirs.

"Overall, then, where do you feel the Keller Plan is most applicable to the teaching of political science?"

"This system would be good for areas where a good part of what you have to learn is relatively unambiguous fact—the evaluation of programs, various attitudes toward welfare legislation (who thought what), how it was passed, how it was stopped. I think it would be a little bit hard for things like political parties, whose role is a little ambiguous. I'm thinking of parties in the sense of, 'Why do parties seem to be necessary for the functioning of democratic government?' 'Why do they seem to work better in England?' 'Why do they seem not to be working here—it is *true* that they are not working here?' It's not exactly value judgments, either. I am thinking of the Broder book—the argument that partisanship is good and necessary, that its accompanying evils are necessary, and you put up with it for the promise of more efficiency later—I think that would be a hard argument for a student to tackle by himself at home.

"Another example which shows the same distinction is, suppose you were giving a course on the Presidency. There are quite a few good readings on the history of the Presidency, on its function, its growth, and the context it operates in, its relationship to the bureaucracy and things like that. But the basic idea, the basic attitude that ten years ago all the liberals wanted a strong President and they wanted to reform Congress so that it would do what the President said, but now they want Congress to reform the Presidency to make it much less powerful—that argument would be hard to deal with in a ten-minutes-with-each-student, Keller Plan format.

"Even if somebody had written exactly what you wanted to bring across, it wouldn't do as well. It wouldn't come across as an important normative question. When people write that sort of thing, it is too open to nit-picking, which the student can't rebut. Also, just presenting the facts of an issue, say, Great Society legislation, can give a different impression of something than consideration of the values and beliefs it represented or opposed."

The distinction between fact and value, between item and context, is at the heart of the difference between the physical sciences and the social sciences. The physical sciences assume that Nature has no

intrinsic values, only immutable laws. The social sciences know that man has values, and that these are the source of his ever-changing laws. The PSI method is admirably equipped to teach the laws, but it can only take note of the values. This is why the PSI method has been such a remarkable success in the physical sciences, but does not promise an equal success in the social sciences. Precisely because norms are not invariant from observer to observer, the PSI method cannot be applied to the whole scope of political science with the same level of efficiency in transmitting knowledge.

In our use of the PSI method we attempted to allow for this fact by making the first objective of each unit the student's awareness of where he or she agreed or disagreed with what was read and why. We hoped to make both the authors' and the students' values a salient part of the course thereby. To the extent that students did not respond to this objective seriously, and successfully got by with an unconsidered answer, we failed in our attempt. But it did appear that for some students this procedure was instructive and valuable—at least their comments indicated this. Were every student to answer every fact-mastery question perfectly, this would allow more time for the student and the instructor to engage in a value-centered debate. And given the one-to-one aspect of the testing situation, this debate could be very specific to the student involved. It would still, however, limit exposure to only those values which the instructor brought to the cross-examination. A good instructor would be aware of this and consciously try to bring up as many possible different views of the situation as he or she thought would be useful. Nevertheless, the potential for an oversight on the instructor's part (due, perhaps, to a generation gap?) combined with the type of socialization which would be present only in a student's interaction with his peers suggest that this approach of requiring value-awareness from the students is only a substitute for a broader exchange among divergent individuals.

The Subject Matter of Political Science and the PSI Method

In discussing the observations made by the graduate teaching assistant, we have focused primarily on the teaching process and only secondarily on the substantive issues involving political science as a discipline. While the fact/value distinction is the most important dimension of the question of the relevance of the PSI method to the teaching of political science, it is not the only one.

The American Political Science Association established a Committee on Pre-Collegiate Education in April of 1970. In the summer of 1971 that committee issued a report, "Political Education in the Public Schools: The Challenge for Political Science," in which it set forth its view of the purposes of pre-collegiate education in political science. Since they found pre-collegiate education in political science to be wanting and since this use of PSI was in the context of initial collegiate

education, the criteria which the committee established can be applied to introductory collegiate education as well as to pre-collegiate education, the argument being that if the public schools do not meet the criteria, it is up to the first-level college courses to remedy the situation. Let us consider each of their conclusions and ask whether the PSI method or the lecture/discussion method might better meet the criterion.

1. Political Science Education Should Transmit to Students a Knowledge About the "Realities" of Political Life As Well As Exposing Them to the Cultural Ideals of American Democracy.

Here the committee is concerned that students not be presented with an unrealistic and romanticized view of politics. The ability of the PSI method to fulfill this objective depends quite critically on the existence of readings which embody the concepts involved, namely, the role of conflict and self-interest and the failures of public institutions to meet the needs of some groups in the population. Most students are exposed to several sources of such realities, whether it be by personal experience or the popular news media or works they may have read on their own. For this kind of information to be presented in the PSI format, however, requires that it have previously been brought together in one or two places. The PSI section of 17.21 used Lockard (1971) and Lowi (1969) for this purpose; their limitations lay in the fact that the evidence which they presented of the shortcomings of the American political system were used to buttress a larger, ideological point. This aspect of argumentation could conceivably put a student off, did he or she not share the view the author was presenting, and thereby encourage the student to dismiss the evidence along with the argument.

In a lecture/discussion classroom evidence can be presented *qua* evidence, by both the instructor and the students. Any ordering of the evidence into an analytic framework which represents a particular political philosophy can be kept independent of the consideration of just what the realities are.

2. Political Science Education Should Transmit to Students A Knowledge About Political Behavior and Processes As Well As Knowledge About Formal Governmental Institutions and Legal Structures.

Here is the behavioralist/institutionalist distinction. The PSI method, by virtue of its being geared to facts, can present the findings of both schools with equal clarity and efficiency. Whether the material to be mastered consists of the rules by which an institution operates, or the findings and major arguments of a significant legal decision, or the processes by which political information is disseminated in a community, or the theroy of attitude formation—all of these specifiable pieces of information can be presented in the PSI format in such a way as to inform the student clearly what is to be learned and to permit

the relatively unambiguous assessment of whether in fact it has been learned.

Typically, the lecture discussion method deals with this aspect of political education by assigning the material in the hope that it will in fact be read and understood and remembered. Then the lecture can amplify certain portions of the material along either factual or value or anecdotal lines and the discussion can center on the implications of this material for the ongoing operation of the political system. In practice, however, such is rarely the case. The better students do the reading, but with varying degrees of comprehension. The lecturer starts class with the question, "What is meant by the phrase 'cognitive dissonance'?" and hopes that at least somebody will raise a hand (and also that it won't be just the student who always does). When no one does, the instructor has no way of knowing whether a) everyone knows, but no one wants to commit himself, b) some people think they know, but do not want to risk being wrong, c) no one did the reading, because it was 1) too hard, 2) too long or 3) too dull, or d) everyone did the reading and saw the words "cognitive dissonance" but no one could understand what they meant. Any one of these reasons for no response has serious implications for the conduct of the course, but the instructor, particularly the novice instructor, has little to go on in determining just what has gone wrong. The PSI method avoids this situation in two ways. First, it forces the instructor to assign readings which present the material he or she wants learned in an unambiguous fashion. (Presumably, the lecturer does this as well, but he or she may not give explicit thought to this requirement.) And if the material to be included in a unit is not unambiguous, the PSI instructor must make it so in the introduction to the unit. Second, the testing process reveals whether the student has in fact learned the material, and if he or she has not, it affords the instructor the opportunity to find out why not—the instructor does not have to speculate along the lines listed above. In addition, if the faster students reveal any difficulties with the material, the instructor can modify the unit for those students who have not yet completed it; he or she does not have to wait until next semester to correct the error.

3. Political Science Education Should Transmit to Students Knowledge About Political Systems Other Than The American System, and Particularly Knowledge About the International System.

Since the committee is writing about the whole scope of precollegiate education, this requirement that such education include an international perspective is not one which an introductory course in American politics need fulfill. Conversely, if one were to consider the application of the PSI method to an introductory course in international relations or in American foreign policy, one would cover the same points made thusfar in the context solely of American politics.

Namely, that factual matters—what is N.A.T.O., what does Article 53 of the United Nations Charter provide for, how is North Vietnam governed, *etc.*—can readily be handled by PSI if the material exists, and that contextual matters—the freezes and thaws of the Cold War, the degree to which the North Vietnamese and South Vietnamese are two different nations of people, the values which circumscribe the exercise of American foreign policy—can best be provided by a competent lecturer, unless, again, precisely those kinds of considerations have already been set forth in the manner in which the lecturer would, in which case he or she can assign the reading(s) and test for the students' comprehension of the points involved.

Perhaps this is a good place to make a distinction *re* values. A given value, for example, that Communist governments are inherently evil, can be taught by the PSI method in the sense that a student can be exposed to the fact that some people hold this value and the student can be asked to "Give three examples where this value has clearly affected a decision of the United States government." What cannot be taught easily by the PSI method is the student's awareness of the values he or she holds and those which others hold, and how those values color the information which they use in making judgments about a political process or system.

4. Political Science Education Should Develop Within Students a Capacity to Think About Political Phenomena in Conceptually Sophisticated Ways.

The committee elaborates this requirement by saying that a capacity to think conceptually means "an ability to view any given political phenomenon in two ways. A person can look upon any given event, institution, behavior, *etc.*, as one member of a more general (abstract) class or population of analytically comparable phenomena. Second, a person is capable of distinguishing among the particular phenomena falling into the general class." In addition, the committee asserts that three capabilities go into "conceptual sophistication": an awareness that phenomena are not completely alike or completely different; an ability to view differences among phenomena as being in degree and not in kind; and, an awareness of the influence of the choice of phenomena to be considered upon the perceptions of differences and similarities.

Here the PSI method probably has the advantage. The process of direct student-teacher interaction in the testing affords a good opportunity for the instructor to be aware of any shortcomings in conceptual sophistication which a given student has and the instructor can draw these out through the cross-examination process. If a student can see only differences between, say, the American and Russian political systems, the instructor can ask about an apparent similarity. If the

student sees two phenomena as being incomparable in nature, the instructor can suggest a possible dimension of comparison. If the student has limited his or her examination to only certain phenomena which fortify a particular view, the instructor can make him or her aware of other phenomena which ought to be included.

The lecture/discussion method can respond to a student's comment which reveals any of these limitations in conceptual sophistication, but it cannot follow this path very far without running the risk of leaving the other students behind. On the other hand, students *may* be able to reveal one another's oversights. The point is that the PSI method builds in an opportunity to educate the student along these lines, while the lecture/discussion method must rely on an active and purposeful interchange among students and instructor. And if the students are at pretty much the same level of conceptual sophistication, or the lack of it, it is unlikely that they will be able to elevate each other.

5. Political Science Education Should Develop Within Students an Understanding of and Skill in the Process of Social Scientific Inquiry.

Under this heading the committee listed seven aspects of "understanding" and thirteen "skills" which, taken together, constitute a full capability in social science methodology. Comprehensive methodological ability, however, cannot be developed by either the lecture/discussion method or the PSI method; they are the province of a laboratory course, almost necessarily a computer-assisted one. If methodological instructional materials of the scope implied above existed, or if political scientists in fact wrote their papers and books along strict methodological lines, then the PSI method could readily test to see whether students were apprehending the issues involved. Even then, instruction would be limited to finding examples of good and bad method; the PSI format does not lend itself to the assessment of a student's own abilities in this area. These would have to be judged from individual research work.

As to which objectives the lecture/discussion method could meet, it would appear to be about equally capable of addressing all of them, but generally incapable of testing for many of them. This is a very general conclusion; its generality reflects the fact that methodological concerns were not addressed by either of the two sections of 17.21 (except the normative/descriptive distinction noted above), nor are they likely to be in an introductory level course in any area of political science except a course given expressly in methodology. Even such a course would be unlikely to recruit students with little previous exposure to the substantive area of political science. The course reported here, then, sheds little light on this aspect of teaching political science, except to note that methodology is not an introductory one.

6. Political Science Education Should Develop Within Students a Capacity To Make Explicit and Analyzed Normative Judgments About Political Decisions and Policies.

The PSI method can force a student to think in normative terms, to make value judgments; this was the purpose of the units' first objective of knowing where one agreed or disagreed with the authors and why. Developing this capacity would seem to hinge upon making the student aware of the existence and role of values in political questions. As discussed above, the lecture/discussion method may expose a student to this facet of politics in an effective way, particularly if the challenges to values come from peers. The difference between the two methods lies in the fact that while the lecturer can address this question and try to elicit responses from the class along this dimension, the instructor in the PSI section can require that every student become aware of the issue and respond to it. A student who wishes not to examine anyone's values may be able to tune out that portion of a lecture/discussion session. The PSI method will require him or her to deal with it.

7. Political Science Education Should Develop Within Students an Understanding of the Social-Psychological Sources and Historical-Cultural Origins of Their Own Political Attitudes and Values, and a Capacity to Critically Analyze the Personal and Social Implications of Alternative Values.

This objective extends the scope of values from the making of normative judgments about political processes to an awareness of the processes by which values are acquired and the implications they have for an individual's normative assessments. The principles of political socialization—how and when it occurs, what affects it, how it has empirically manifested itself in the American political experience—can readily be taught by the PSI method. The PSI section of 17.21 included a unit on public opinion and American democracy which addressed a portion of this area, the role of ideology. It would be quite easy within the PSI format to emphasize this area by asking students to generate possible policy decisions in a given issue area, to make explicit the values they embody, and to state what type of background would lead to holding which values and therefore to endorsing which policy alternative.

A lecture/discussion class could address these concerns in a more interactive way, however, *if the students were at equivalent levels of personal awareness and knowledge of the value-formation process.* Once more we encounter the chief drawback of a lecture/discussion classroom, the possibility that students enter each hour with differing levels of knowledge and awareness, which set sharp limits on the amount and quality of the exchange which can take place during discussion. The lecturer can attempt to even any disparities out, but he or she has no guarantee that what is presented will in fact be understood or take hold.

8. Political Science Education Should Develop Within Students an Understanding of the Capacities and Skills Needed to Participate Effectively and Democratically in the Life of the Society.

This understanding, writes the committee, consists of at least seven component elements:

1. An interest in public affairs and some sense of "public regardedness."
2. An ability to tolerate conflict and divergent values and beliefs.
3. An ability to consider in particular situations the democratic basis, the feasibility, and the likely consequences of alternative courses of action.
4. An ability to look at the viewpoints and problems of others.
5. An ability to identify alternative courses of action and to assess the probability that the alternative selected will achieve the desired goals.
6. An ability to consider group factors and institutional implications of decisions.
7. An ability to consider relevant democratic principles and values involved in decisions.

The unifying theme of the PSI section we taught was related to this aspect of political science education; it was based on the examination of what a single citizen might do to affect the American political process, with the introductions to each unit threading this link through the semester's topics. The section, however, did not touch on all seven of the components listed abive.

First, it assumed an interest in public affairs and a sense of public regardedness from the fact that the students elected to take the course.

Second, while it stressed the role of values, it did not provide an opportunity for the testing of the ability to tolerate conflict. This is the lecture/discussion method can do; it is, in fact, one of that method's strong points.

Third, while it considered a wide variety of actions an individual could take, either singly or as a part of a group, it did not attempt to determine the feasibility and likely consequences of alternative actions to any great degree. In some of the units the students were charged with the responsibility for knowing the arguments on both sides of an issue, arguments which were phrased in terms of the consequences an action might have (community control of the ghetto, for example), or with the responsibility for exploring the likelihood of an asserted consequence's occurring through an analysis of the political forces favoring and opposing its outcome. But the kind of insightful judgment which results from, say, extensive case study was not a goal of the PSI section. Case studies could easily be adapted to the PSI method, however, if an instructor felt that this aspect of the development of participatory skills deserved emphasis.

Fourth, the PSI units did present viewpoints and problems of groups in the society which may have been unfamiliar to the students. The units did not, however, necessarily develop the ability to regard these viewpoints openly. The unit tests can require that someone master the essentials of an argument, but, in and of itself, they do not develop the

willingness to see the other person's point of view. The lecture/discussion method may facilitate this democratic attitude, if the student finds such discussions rewarding and informative. The PSI method does not contain this opportunity.

Fifth, the ability to assess the probability of success of an action alternative is a more sophisticated refinement of the ability to identify the likely consequences of action. Whether such a "feel" for outcomes can be transmitted in any classroom, the author doubts. If it can, it probably results from long-term analysis of specific policy issues with their attendant case studies and also the opportunity to engage in activities directly related to the issue, as in a work-study program.

Sixth, the consideration of group factors and institutional implications of policy decisions is an activity which the PSI method is suited for, insofar as these phenomena have been observed and reported in the form of regularly occurring events. Studies of the effects of rule changes in the House of Representatives, of the effect of the Legislative Reorganization Act of 1946, of the establishment of the Office of Economic Opportunity can be assigned in the PSI format quite easily. All the instructor need do is to decide which findings and conclusions are the most important and test for mastery of those facts. The lecture/discussion method can also take up these phenomena, but it cannot so easily insure that the students will in fact grasp the most important essentials involved.

Finally, if an instructor chooses to emphasize the democratic aspects of principles and values involved in decisions, he or she will likely want to do so in the lecture/discussion format, basically because questions of the democratic nature of principles, values and actions are questions of degree, not of kind. The PSI method thrives on unambiguity; where judgments involve questions of degree, the method is less satisfactory. It is not a good PSI unit question to ask, "How democratic is the selection of committee chairmen by the Democratic Caucus in the House of Representatives?" Nor can one sensibly ask, "*Is* the selection of committee chairmen democratic?"

The Personalized System of Instruction and the Teaching of Political Science

The last section of this paper will attempt to draw together the discussions which have preceded into some sort of conclusion as to the applicability of the PSI method to the teaching of political science.

Seven dimensions of the teaching of political science should be considered by an instructor in deciding whether to use the Personalized System of Instruction:

1. The substantive content of the course.
2. The degree to which the instructor wishes to test for student achievement.
3. The level of the instructor's interest in and concern for each individual student.

4. The instructor's view of the value and purpose of class discussion.
5. The instructor's preference between analytical and descriptive modes of thought.
6. The time available to the instructor.
7. The currency of the subject matter to be taught.

Let me summarize the relevance of each of these dimensions to the decision to use the PSI method.

1. **The substantive content of the course.** If we may categorize the content of political science as falling into three areas, facts (*i.e.*, information invariant under differing observers), methodology, and the role of values in the understanding of political processes, then we may say that the degree of applicability of the PSI method depends upon the mix of these three elements which the instructor wishes to present in an introductory course. The PSI method teaches facts very well. This study did not consider the teaching of social science methodology, so no conclusion can be reached in that area. The role of values *can* be presented by the PSI method, but the lecture/discussion method illuminates this point more finely and clearly. Therefore, if an instructor wishes to concentrate on teaching students certain basic information about a topic in political science, he or she is advised to use the PSI method. If, however, the instructor feels that the role of values is central to an appreciation of political phenomena and that it should therefore be introduced as early in political science education as possible, the lecture/discussion format should be used.

2. **Testing for achievement.** If an instructor wishes to be certain that students have in fact mastered certain basic information about a topic in political science, the PSI method offers an excellent means of doing so. In addition, the PSI format allows the instructor to probe the value structure of *individual* students, to challenge that structure either with facts or opposing values, to make the students more aware of their own values and how they affect perceptions of and judgments about political phenomena. The PSI method, however, limits the students' exposure to alternative points of view to those presented by the instructor during the testing process, whether through the assignment of material on the issue or through cross-examination after the tests are actually written.

The lecture/discussion format permits testing for factual understanding and recall as well, but it does not allow the student more than one opportunity to master the material, and it places a large premium on learning material before a specific point in time.

3. **Concern for individual students.** An instructor's class enrollment may be so large that he or she cannot take an individual interest in each student. The PSI method permits individual attention within the

context of large enrollment. If, however, the instructor sees the introductory course as a screening mechanism which identifies those students having promise within the discipline of political science by their rising above the general level of the class, then he or she may not be concerned with attending to each and every student, many of whom may not consider the course important enough to their interests to warrant that expenditure of energy.

The PSI method enacts an instructor's concern for individual students in two ways. First, it does not leave the slower (for whatever reason) student irrevocably behind. The self-pacing aspect means that each student can feel that he or she can master some portion of the course, even if not all of it, rather than having to accept the notion that since material must be covered by certain points in time, in order to write examinations he or she is going to learn only a little bit of everything and nothing very much about anything. Second, the individualized interaction between instructor and student during testing makes it possible for the instructor to identify exactly what concepts a particular student is having difficulty comprehending; the instructor can either tutor the student at the time or assign further study materials, perhaps not included in the basic unit, which will help clarify the ideas involved.

4. **The value and purpose of class discussion.** The graduate teaching assistant spoke above of the problem of differing levels of political information and conceptual skill among students as a barrier to effective class discussion. Another instructor might not agree, feeling that such differences tend to awaken students to the range of the issue more than they tend to inhibit the exchange of viewpoints. If, however, an instructor's experience has been that such differences can limit the discussion to too small a portion of the class, he or she can use the PSI method to bring the students to a common level of familiarity with and understanding of a particular topic. Or, if an instructor's feeling is that far too often class discussion changes no opinions and only allows the more aggressive students to command an audience, he or she may wish to eliminate it altogether and rely exclusively on the PSI method. Such an instructor should keep in mind, however, the socialization aspects of class discussion which were missed by some of the PSI students in our section.

5. **Analytical versus descriptive modes of thought.** The PSI method of teaching requires an explicitness of presentation of course material unapproached by the lecture/discussion method. The PSI instructor must identify precisely what he or she considers to be essential about the topic to be studied and why this information is essential, so that it can be presented to the students in a way which allows them to master the material. To specify the latter requires that the instructor analyze the

structure of the topic and be able to present that structure to the students in the units, so that they can know explicitly what is required of them. If the instructor's preferred style of teaching is descriptive and not analytical, if he or she prefers to see political phenomena in their broad historical context rather than to view them in a behavioralist way, for example, he or she will not want to satisfy the PSI method's demands for explicitness. If, however, an instructor enjoys being forced to examine a subject in detail in order to justify his or her own conclusions about it, then the PSI method will appeal to that instructor and provide him or her with some satisfaction in the completion of devising units and their objectives.

6. **Time commitment.** In our course we found that the graduate assistant needed less time to prepare for a PSI-taught section than he had needed for a lecture/discussion section on essentially the same material, but that the lecturer in charge of the other lecture/discussion section needed considerably less time to prepare for his classes than did the graduate assistant or the investigator under the PSI method. For an instructor who has already prepared lectures for an introductory political science course to recast his or her material into the PSI unit format will require a considerable expenditure of preparation time, ranging from at least four hours to perhaps eight hours for each week's unit, the exact amount differing with the instructor's nature and decreasing with experience in writing PSI units.

Also to be considered is the availability of tutoring assistance, if the class size exceeds ten or so. In the absence of assisting tutors, the demands on the instructor's time may be prohibitive. Experience in this study showed that about 15 minutes is an average minimum time for thoroughly correcting and discussing a unit test, if that test takes about one-half hour for the student to write. Even if the unit tests were reduced in scope to that which could be covered by a student in 20 minutes of writing and the 2/1 ratio of test time to correction/discussion time held, this would mean that, under ideal student arrival and departure patterns, an instructor could adequately test only six students an hour, or eighteen a week in a typical college undergraduate course. This is very much an upper limit.

7. **The currency of the topic.** The basic input to the PSI method is written material. If the topic an instructor wishes to consider is so new to the discipline that comprehensive writings on the subject have not yet appeared in the literature, his or her only recourse under the PSI method is either to write the material or, given the technology, prepare a recorded lecture to which students can listen at their convenience. Even if writings are extensive on the subject, it may still be that they do not satisfy the explicitness requirement set forth above. The instructor is again left with no recourse but to fill in the gaps.

These seven dimensions of teaching introductory political science are what the author feels are relevant to the decision to utilize the Personalized System of Instruction in the discipline.

Recommendations and Conclusion

In the light of the above considerations, therefore, the following recommendation is offered:

Teachers of introductory level political science courses should consider adopting a hybrid of the two teaching methods, the Personalized System of Instruction and the lecture/discussion method. This hybrid would consist of preparing students to participate in a class discussion on an equivalent level of factual knowledge and conceptual sophistication by having them complete a certain number of substantive PSI units before the convention of a class for the purposes of the instructor providing a larger historical context of the topics by means of lecture and of the class and instructor discussing the topics with a particular view to the role played by personal values in the evolution of a particular political process.

The idea here is that after, say, three or four units had been completed by most of the students, the instructor would convene a lecture/discussion meeting, perhaps during the hours generally reserved for testing. Some students, however, might not complete the necessary number of units. This could be handled in either of two ways. The instructor could allow them to come to the discussion, with the expectation that the class would not pause to bring the lagging students up to date. Or, the instructor could deny them admission to the lecture/discussion if he or she felt that mastery of the basic information was more important.

In practice, this might not be too severe a problem. Particularly at the beginning of the semester, students complete units at about a one-per-week pace. If the first discussion period were based on the first three units, it probably could be held at the end of the fourth week, for example. Particularly if the instructor is an informative and interesting lecturer, the incentive to complete units on time might be increased, lessening the problem further.

This hybrid might also answer the objections of students who complain that discussions are a waste of time because "no one has anything to say, and says it," as one student put it. This way, everyone would have a common level of understanding, and while the better students might still tend to carry the issue beyond the appreciation of many in the class, at least there would be few instances of time wasted by ignorance.

Another aspect of the proposed hybrid relates to the problem of managing a class discussion, particularly relevant to the beginning instructor. As noted earlier, a class which does not respond to the instructor's efforts may do so for a varjety of reasons, each of which could call for a different approach by the instructor. A teaching

method which included unit testing would allow the instructor the opportunity to get to know the students on an individual basis, to become aware of which ones need drawing out, of the particular interests the students have, of how they respond to him as an individual. All this information is very valuable for deciding what to lecture on, who is most likely to contribute spontaneously, who will have to be encouraged, *etc.* By reducing the uncertainty in the situation for the instructor as well as for the students, the learning process should proceed with less anxiety all around. Of course, if an instructor likes the challenge of the unknown, likes to have anxiety fuel efforts, he or she may not prefer this suggestion. Such people will probably want to continue to use the straight lecture/discussion method.

This hybrid method would be most appropriate to areas of political science where historical context and normative considerations are a large part of the subject matter. For example, a course on environmental policy might well use the PSI units to inform the students of the basic issues involved, the constellation of forces, the current status of legislation, and even the scientific considerations relevant to the political decisions. Questions of the allocation of values, of the trade-offs between economic development and the preservation of resources, would then be aired in the discussion sections, once the basic facts had been agreed upon.

The Presidency is another appropriate subject for the hybrid, involving as it does issues of law and of institutional relationships, as well as public policy dimensions which can only be appreciated in terms of their historical development. Political parties are a third candidate for this approach, because of their multiplicity of functions and their immediate relationship to individual ideology.

Courses in which the PSI method *alone* might be best would include the specific history of legislation on a particular issue, such as the development of social welfare programs in the United States since the Depression, or a course on Constitutional law, where the whole framework is analytical, or on public administration, or on international law.

Are there any political science courses at the introductory level which could not profit by the PSI method to any degree? It is the author's *opinion* that there are none at the introductory level. This judgment is based on the assumption that at the introductory level one invariably finds a disparity of interest and knowledge and that the PSI method is an efficient means for reducing that disparity.

System Implications

What are the implications for the entire political science curriculum of adopting the PSI method, in either complete or hybrid fashion? They are several.

First, we found that the PSI section students spent more time on 17.21 than on most of their other academic subjects. A wholesale adop-

tion of the PSI method for all introductory political science courses could easily catch many students in a time bind. Of course, under the PSI method they can choose how far they wish to go in completing units, but we ought not to deliberately set up a situation which encourages students to complete less than the full course. A PSI hybrid would reduce preparation time by the students somewhat, assuming that the class discussion meetings would replace units and that preparing for the discussion itself would not require as much time as mastering a unit.

Second, any adoption of the PSI method requires people to test the students. One instructor cannot handle many more than 10 students. If classes are larger than this, the instructor has the problem of recruiting additional graders. And if the instructor is just beginning a PSI section he or she will have no student veterans among whom he can look for potential graders. Thus, the first implementation will have to be within a small section, unless the instructor can obtain the services of a graduate student.

Third, under the PSI method there is really no such thing as a "gentleman's C." Many students take introductory political science courses out of only a mild interest in the discipline, but perhaps a greater interest in the subject matter. The PSI method does not allow them to learn, say, three-fourths of everything and thereby earn a grade of 75%. They must, if they want only a "C", learn everything required by three-fourths of the units. (None of the non-political science majors in the PSI section of 17.21 complained of this aspect, however.)

Fourth, the potential PSI instructor must be willing to spend the time to find course materials which can be presented in the PSI format. Just as this experiment revealed the impracticability of assigning portions of the Pentagon Papers to a PSI section, so too may an instructor find that some of his or her most cherished course material simply is too impressionistic and not sufficiently specific for it to be adopted to the unit mastery format.

Fifth, such an adoption by a department at the introductory level might exact too high a price among its faculty who have invested many hours in preparing good lecture material for them to lay most of it aside with no misgivings. On the other hand, the PSI method does not require of a beginning instructor the wide-ranging brilliance which most feel marks a good lecture. By limiting lectures to, say, four during the term, the PSI hybrid could give the novice instructor sufficient opportunity to prepare those four well and to deliver them to a group of students he has already come to know, at least academically, thus giving him also the chance to fashion his lectures more closely to their interests and needs.

Sixth, the secretarial time involved in typing up units and the expense of duplicating them for a large number of students might be a

consideration, since these costs are not incurred by the lecture/discussion method.

Seventh, the instructor may find that he or she likes the PSI format but that the political science literature in his or her subject area does not provide the right kind of material for units. The only viable choice may be to write the material, which will certainly cost, although, hopefully, it will reward.

Eighth, were a department to adopt the PSI method in a few of its introductory courses and continue to develop the PSI curriculum for a few years, it would as a body generate a substantial number of units, refined by experience, as well as a group of good unit writers. Such collections could be published for other universities to adopt, thereby garnering great appreciation and respect in the discipline for that department's attention to the challenge of good teaching.

Finally, a personal note. For me, it was a very rewarding experience to sit down with students on a one-to-one basis and share knowledge in an exchange between two real people. Two particular students underlined this important feature of PSI. One was an architecture student who, although gifted in the visual arts, had not learned to write or readily express himself verbally until he was *eighteen,* due to a childhood disability. His command of written English was not good; his grammar was faulty and his syntax was very elliptical. In any ordinary section he would have been severely handicapped by his inability to write well. With the Personalized System of Instruction, however, it was easy to see that he could and did in fact grasp the material, once Don or I sat down with him to discuss it. With the time available over the entire semester, he was able to write a fine paper and earn an A-.

The other person was a 40-year-old Army R.O.T.C. sergeant. Quite frankly, when I first met him in class I was very pessimistic about how he would fit in, especially given his limited academic background of only six community college courses. Although it was more difficult for him than for the other students, he too mastered the material, completing all but one unit, writing a good paper and earning a B+.

I feel quite certain that a lecture/discussion section of 17.21 would have foreordained no better than a grade of C for both of these men. Both might have accepted such a grade as reasonable, if disappointing. But in both instances it would have been avoidable and unnecessary. Instead, each had a success experience—each "learned a lot."

In so doing they testified to the validity of Keller's (1968) assertion:

> Especially important, in a course taught by such a method, is the fact that any differences in social, economic, cultural, and ethnic background are completely and repeatedly subordinated to a friendly intellectual relationship between two human beings throughout a period of 15 weeks or more. Also, in such a course, a lonesome, ill-favored, underprivileged, badly schooled, or otherwise handicapped boy or girl can be assured at least a modicum of individual attention, approval, encouragement, and a chance to succeed.

References

KELLER, F.S. "Good-bye Teacher . . . "Journal of Applied Behavior Analysis, 1968, 1, 79-89.

LOCKARD, D. The Perverted Priorities of American Politics (New York: Macmillan, 1971).

LOWI, T. The End of Liberalism (New York: Norton, 1969).

APPENDICES

Examples of Course Units in American Politics

Course Outline:
Introduction to the American
Political Process . . . . . p. 83

Unit 1:
"The Political Sociology of Political Science" . . . . . p. 88

Unit 3:
"Mass Politics—Public Opinion and American
Democracy" . . . . . p. 91

Unit 6:
"Groups Interests, and Leverage" . . . . . p. 94

Unit 8:
"Congress" . . . . . p. 97

COURSE OUTLINE:

INTRODUCTION TO THE AMERICAN POLITICAL PROCESS

Introduction. This section of 17.21 will be an experimental one. In place of the usual lecture and class discussion method, you will pace yourself and study American political processes on your own, by what has come to be called the "Keller plan," the mechanics of which are explained.

The course's main theme is the extent to which an individual citizen can or could influence his government. This focus will be present throughout the units the course is divided into, which include elites, cultural traditions, the effect of public opinion, political parties, voting behavior, groups and lobbys, the courts, the ineffectiveness of the Congress vs. the supremacy of the President, the Pentagon Papers, "reordering priorities," and the prospects for fundamental change in the system. We have tried to put together a reading list which is current, diverse and stimulative of your own opinions. For, as you will see more of below, your own well thought out opinions will be, we hope, an important product of the self-study method.

The Keller Plan. Here's how self-paced study works. The course's syllabus is divided into twelve units, each representing about one week's work. At the first or second meeting of the class (Friday, Feb. 4; Wednesday, Feb. 9) you pick up a "study guide" for the first unit, which is about the "establishment," elites, and majority rule. The study guide has an introduction, which summarizes the main ideas that the unit is trying to convey. This introduction is followed by a set of *objectives*, key elements in the Keller plan. These objectives are the explicit goals for the unit. They are clearly stated in such a way that you can tell by yourself whether or not you have achieved mastery of these goals. The general format of the objectives section is a list of questions to guide you in your reading of each author. These questions indicate what we feel are the necessary things to know about each reading. There is no "hidden curriculum." If you can answer all the questions, you have mastered what we feel are the most important points covered by the unit.

When you feel you have mastered the objectives for the first unit, come into room E53-212 either on Wednesday between 11 a.m. and 1 p.m. or on Friday between 10 a.m. and noon, and ask for a test on the material. You will be given a short, written, closed-book test covering the objectives on unit one. *Every question on the test will be one of the ones on the study guide.* It is "illegal" for us to ask you a question not covered by the objectives for the unit. *If we violate this rule, you can refuse to take the test with no penalty.*

When you finish the test (it should take less than a half hour, but there is no time limit), hand it to Don Dickson. He will immediately grade it in writing, on the test booklet, in your presence. If he is unsure of what you have written, he will ask you to clarify your answer. And he may ask you orally an additional question or questions not on the test you took, but covered by the objectives of the unit. The possible grades are "pass" and "not pass."

If you answer all the questions, written and oral (if any) correctly, you have passed the first unit and should pick up a copy of the study guide for the next unit. The reason why you must answer all the questions correctly is because we have told you exactly the minimum we want you to get out of the unit.

If you do not answer all the questions correctly, ask Don for any help you feel you need in understanding either the materials or the procedure, go back and re-study what you missed, and come back and take another (different) test on the same unit. (Tests may differ in which questions they contain, but *all* questions on *every* test must be covered by the objectives for the unit as stated in the study guide.) THERE IS NO PENALTY FOR NOT PASSING A TEST—NONE WHATSOEVER. You may take as many tests as you need to pass a unit. You must wait at least a half hour, however, before taking another test; this rule is to discourage you from running to the book, "memorizing" the

point in question, and running back to write it down on a test booklet. That's not mastery. If you find you need more than two tests to pass a unit, check with Don to see if it's your difficulty or our not being clear enough.

The advantages of self-paced study are supposed to be that it allows you to work when you want to or can; it lets you know how you are doing often enough, fast enough, and without any risk so that you can alter your study routine or get help if you need to; you can finish the course early if you want to, thus freeing time later in the term for other, more rigidly scheduled courses (or for spring fever); it puts you in direct, personal contact with the instructor, who thereby knows you as an individual, how you are doing, and what your ideas and interests are; and, it eliminates the need to "psych out" an exam.

The primary disadvantage of the Keller plan is that it allows procrastination; if you need to be bludgeoned by deadlines into doing things, you may have difficulty adjusting to your freedom. The first unit is the hardest, though, in this regard. Once you have taken a test and have seen your results graded and commented upon immediately and personally, with no waiting around (other than maybe for the guy ahead of you to finish), we think you will want to go on to the next unit.

Another disadvantage is that with this method, there is no class discussion. You can and are encouraged to develop your own ideas and opinions with Don, but you will not have the regular benefit of cross-pollination from your classmates. *Nothing* (except consideration for other test-takers), *however, prevents you from using the open class time* (or any other time) *for discussion about anything in the course with whoever is around.*

Grade Policy. If you pass all the units you get a guaranteed B. The reason for this is simple: if you have passed all the units, you have mastered all that we have required, and that is worth at least a B. Because this is an experiment and therefore requires some hard data by which to judge its success, everyone will have to take a final exam. (17.21 has usually required one, anyway.) Your grade on the final and on a required term paper will determine whether your guaranteed B becomes an A. *If you have passed all the units,* even if both your final exam and paper are disasters, your B is guaranteed; we will assume the fault.

As to what happens if you do *not* pass all the units, the grading scheme will be approximately this:

Final exam counts 15%		12 units done = B
		11 units done = B−
Term paper counts 20%	and	10 units done = C+
		9 units done = C
Units completed = 65%		8 units done = C−, etc.

Alas, one thing is certain: there can be no Incompletes (except for illness, etc.). This rule is our only real weapon against catastrophic procrastination.

Pacing Yourself. For your convenience (only), here is a straight-line path to finishing by the end of the semester. Note that it gives you two weeks to pass the first unit.

Unit 1 by Feb. 18
Unit 2 by Feb. 25
Unit 3 by March 3
Unit 4 by March 10
Unit 5 by March 17
Unit 6 by March 24
Unit 7 by April 7
Unit 8 by April 14
Unit 9 by April 21
Unit 10 by April 28
Unit 11 by May 5
Unit 12 by May 12

Notices and Such. Since we won't all meet as a group again, the only way we can communicate as a class is via the blackboard in E53-212. Be sure to check it every time you come in. Also, you can come in at any time during the two two-hour sessions on Wednesday and Friday, whether you come to pass a test or to talk to Don or your fellow students about what you're doing. If you come to pass a test, however, try to leave yourself enough time to take the test and have it graded. Don't, for example, ask for a test with only 20 minutes left in the two hours; it will just end up being a hassle for you or Don or both.

"Required" Texts. Since all of the assigned readings will be in Dewey Reserve, no texts are acutally required. Many of you, however, may enjoy owning the following paperbacks:

W. Dean Burnham, *Critical Elections and the Mainsprings of American Politics* (N.Y.: Norton, 1970).

Kenneth M. Dolbeare and Murray J. Edelman, *American Politics* (Lexington, Mass.: D.C. Heath, 1971).

C. William Domhoff, *Who Rules America?*

Anthony Lewis, *Gideon's Trumpet* (N.Y.: Vintage Books, 1966).

Duane Lockard, *The Perverted Priorities of American Politics* (N.Y.: Macmillan, 1971).

Theodore Lowi, *The End of Liberalism* (N.Y.: Norton, 1969).

The New York Times, The Pentagon Papers (N.Y.: Bantam, 1971).

Mancur Olson, *The Logic of Collective Action* (Cambridge, Mass.: Harvard U., 1965).

Term Papers. We are really flexible about this—it's pretty much what you want to do. We hope that the units will inspire you, but, basically, all you have to do is make a case for it with the instructor and go do it. If you want some suggestions, however, feel free to ask.

Beefs and Gripes. Whenever you feel that the questions listed under an "Objectives" section of a study guide miss an important point, you may on your test replace any one of our questions with one of your own formulation which you feel addresses the important point(s) we missed. You need not answer your own question, but you must justify your choice of the point and the question covered by it.

If you really can't pace yourself, if you absolutely cannot work without some sort of deadline, let us know. You are not captive guinea pigs; we will try to work out some other option for you.

Whenever you feel you have been asked an unfair question (i.e., one falling outside the stated objectives of the unit) or been graded unfairly, argue it with Don. If you cannot agree, you can appeal to Prof. Burnham, who is in charge of the course. He knows the rules and spirit of the Keller plan and he will arbitrate by them.

INTRODUCTION TO THE AMERICAN POLITICAL PROCESS

UNIT I: THE POLITICAL SOCIOLOGY OF POLITICAL SCIENCE

Introduction. This first unit will introduce both some basic concepts about democracy in the United States and an idea of what political scientists do. One of the things political scientists try to do is to develop theories of how people organize themselves politically and, once organized, how their political system works. In the first reading the Lockard chapter will set forth notions about "power," "elites," and "the establishment" in the United States and how they interrelate. Dahl's chapter 5 in *A Preface to Democratic Theory* will talk about just what is involved in an election to choose candidate A or B or C, specifically, the concept of majority rule through elections and the degree to which this actually occurs in America. Walker will criticize his fellow political scientists for developing an "elitist" theory of democracy as though it were unquestionably a good thing, and the second Dahl piece will attempt to rebut him.

The Dahl-Walker interchange is only three shots in a running battle within the profession of political science. This battle began again in earnest perhaps ten years ago, and continues now. In a larger sense it contains contrasting philosophical positions first set out by Plato and Aristotle, involving epistemological problems of reality, possibility, human knowledge, and scientific method.

Thomas Kuhn, in *The Structure of Scientific Revolutions*, has traced the history of science as the periodic replacement of old paradigms with new ones. To the extent that his picture is accurate, it may be applied by analogy to the proto-science of political science. Grossly oversimplified, the study of American politics has undergone several transformations, from the Founding Fathers' concern with constitutions, to Woodrow Wilson's interest in the workings of institutions, to the post-war preoccupation with behavioral sciences. Behavioralism (following Aristotle) has emphasized measurement, precise conceptualization, strict reliance on observable data, and other tenets of

scientific method. Robert Dahl has in many ways represented the best of the workers in that tradition.

During the 1960s vigorous criticism arose against the "pluralist" school represented by Dahl, on the grounds that it whitewashed the faults of the American political system and thereby supported a misleading ideology and conservative regimes. More philosophical criticisms have claimed that an emphasis on observable reality and scientific method seriously neglects attention, as Plato paid, to better ways of structuring society, politics, and government, and to criteria for evaluating the goodness of social arrangements.

This first unit deals with these issues on several levels. Some people feel that these issues go to the heart of the relevance, credibility, and viability of political science.

Obejctives. One of the purposes of this section of 17.21 is to help you develop your own ability to be critical, to examine assertions and arguments in the light of your own experience, no matter how limited that experience might appear to be to you. So, for every unit in the course the first objective will be for you to be able to answer these questions:

What ideas and values (explicit or implicit) of the author do you agree with especially? Why?
Which do you disagree with especially? Why?
If you find you neither agree or disagree particularly, why?

In addition, the other objective of this first unit is to be able to answer the following questions correctly where they call for an accurate representation of an author's assertions and thoughtfully where they call for your considered reaction or opinion:

Lockard:

Who or what is Lockard's "establishment"?

Who makes up "the elite"? What are the qualifications for membership?

What constitutes "power" in the political system? When someone has power—power to do what and how?

What circumstances in America act to *prevent* power from accumulating in the hands of an elite few? What circumstances *facilitate* power accumulating to an elite?

Dahl (Preface):

To what extent does an election implement majority rule?

What does "minorities rule" mean? How is it different from "majority" rule?

In what sense can the majority be said to rule through elections?

What minorities can elect the President? What minorities can elect a majority of the Senate? the House?

How does Dahl describe (and support his description of) the "normal" political process in the United States?

Walker:

What is the "classical" theory of democracy? What can be said to be wrong with it as a description of the United States?

What is the "elitist" theory of democracy? What are its basic assumptions?

What is "wrong" with "elitist" democracy from Walker's moral point of view?

According to "elitist" theory, how do citizens influence leaders?

According to "elitist" theory, is citizen political activity desirable? Why?

Dahl: (Further Reflections)

What is the difference between "empirical" and "normative" theory? How does this distinction relate to the Walker-Dahl debate?

How do you feel about the two articles, particularly as examples of what political scientists "do"?

Suggested Procedure. Read:

Duane Lockard, *The Perverted Priorities of American Politics*, pp. 1-26.

Robert A. Dahl, *A Preface to Democratic Theory*, chapter 5.

J. L. Walker, "A Critique of the Elitist Theory of Democracy," in the *American Political Science Review, 60* (1966), pp. 285-295.

Robert A. Dahl, "Further Reflections on 'The Elitist Theory of Democracy'," *American Political Science Review, 60* (1966), pp. 296-305.

INTRODUCTION TO THE AMERICAN POLITICAL PROCESS

UNIT 3: MASS POLITICS—PUBLIC OPINION AND AMERICAN DEMOCRACY

Introduction. One of the key elements that define a democracy is the idea that a democracy is the political system which is most responsive to the will of the people living under it, from which it follows that a successful political leader in a democracy must be tuned into what the people want—"responsive to public opinion" is the usual phrase. This raises some research questions: How are people's political beliefs formed? How are these beliefs structured or related to each other? How are they translated into public policy? In Unit 1, Dahl analyzed the difficulty in discovering policy preferences from election outcomes. In Unit 2, Lowi described how much of public policy reflects an ideology, that of "interest group liberalism." In this unit, Converse attempts to find out whether ideologies are characteristic of elites only, or of the general public, too. The Converse reading is somewhat theoretical, but it does set forth some notions about what a "belief system" is, what delimits it, and what different degrees of elaborateness of belief systems can be distinguished. In particular, this chapter gives specific scientific recognition and content to the concept of "issue publics," a common-sense idea which, however, may seem to contradict another common-sense idea, the "elite." The first V. O. Key reading looks more directly at the actual relationship between public opinion and public policy, and puts the finger on the "real villain" in the problem of democratic government. The second Key reading looks at the impact of family and education on party identification, political participation, and political efficacy (the sense that one has an impact, that one can be heard), and it looks at the role of *elite* opinion as it intervenes between government and the masses. Be prepared for some cherished myths to go up in smoke.

Objectives. Remember that a primary objective of every unit is for you to be able to state clearly where and why you agree or disagree with each author you read. In addition, the other objective for this unit is for you to be able to answer any of the following questions accurately, where they call for factual information, and thoughtfully, where they call for your views:

Converse:

What is the "centrality" of a belief?

What does Converse say is the relationship of elite belief systems and belief systems in the mass public? How do they differ; how are they similar?

To what extent are groups of people as groups (blacks, women, union members, etc.) used by people as reference points or organizing ideas in belief systems which bear on politics (judging from the scanty evidence Converse presents)?

In talking about changes in beliefs over time, Converse talks about a "black and white model" of change and of a "third force" of people. What does he mean by these terms?

Who belongs to the "issue publics"?

Key ("Decay")

What is wrong with mass public opinion as a restraint on democratic governments?

What, does Key say, is the linkage between the government and mass public opinion?

Key ("Pub Op & Am Dem")

What parental party identification combinations tend to produce the largest percentage of children who term themselves "Independents"?

What is the general relationship between a father's occupational status and his son's sense of political efficacy?

Table 13.2 (p.320) seems to suggest that the more education a son or daughter gets, the greater the likelihood of the child's achieving a higher status occupation. Does education, then, cause a discrepancy between generational occupational status?

Key says (p. 548) that "a basic prerequisite (of democracy) is that the population be pervaded by a national loyalty. . .that the population not consist of segments each with its own sense of separateness." We have a democracy, yet we are notoriously, proudly in fact, a collection of different segments. What holds us together?

Study Notes. Don't expect to understand the reference to the experiment with "Barbara-type syllogisms" in the third paragraph of part II of Converse, nor every nuance of his methodology in deriving his "black-and-white/third force" model. Also in Converse, note that he may be assuming that the liberal/conservative distinction is the only legitimate dichotomy in American political ideology; this assumption is by no means proven.

Suggested Procedure. Read:

P. E. Converse, "The Nature of Belief Systems in Mass Publics," in David Apter (ed.) *Ideology and Discontent*.

V. O. Key, Jr.: "Public Opinion and the Decay of Democracy," in the *Virginia Quarterly Review, 37* (1961), 481-494.
V. O. Key, Jr., *Public Opinion and American Democracy*, chs. 12, 13 and 21.

INTRODUCTION TO THE AMERICAN POLITICAL PROCESS

UNIT 6:
GROUPS, INTERESTS, AND LEVERAGE

Introduction. This unit marks the halfway point; perhaps this is a good place to look back over what we've seen so far.

An implicit theme underlying much of the reading so far is the question of what we as individuals can do to influence politics. Some of the ways we have touched on this question are:

(a) Since we are talking about exercising our political power, what *is* power? What could we do with different kinds of power?

(b) If we vote in elections, what difference does it make?

(c) How does the government's outlook on the "activity" and "legitimacy" of citizen groups affect our chances of being heard? What does "being heard" mean?

(d) Do political elites welcome or resist our attempts to participate in politics?

(e) If we wanted to start an explicitly working-class political movement, what stumbling blocks would we face?

(f) Suppose we were successful in exerting some control over the government—does the government itself have enough power and authority to make and enforce effective decisions? Or would we be better off trying to accumulate private power and get the government to let us make decisions for it?

(g) If we want to get widespread support from the mass public, should we emphasize ideological appeals or group benefits? Should we use the same arguments for everyone or concentrate on certain issues with certain publics? Should we try to reach all the people or concentrate on activists and opinion leaders? Should we concentrate on people in certain occupational or educational categories?

(h) Or instead of trying to mobilize the masses, should we try to become part of the political elite ourselves?

(i) Perhaps we should try to use the party system to further our political objectives. What does it do? How does it work? How could we use it?

(j) Is there enough fluidity, changing loyalties, shifting of issues at the present time so we could bring new issues to the forefront, create new alliances?

(k) Should we support long-range efforts to create a new kind of party system? Would this give us more control over the parties, give the parties more control over the government, give the government more power against powerful economic elites?

(l) If we want to expose existing elites in order to contest their power or replace them, where should we look for them? How would we identify them?

Few of these questions have been specifically asked or answered in the readings, but we hope you have gained some insight into facts, considerations and perspectives which may help you in thinking about such questions.

Unit 6 addresses similar questions more directly In it you will encounter theories which should help in thinking about such questions as:

(a) Should we work primarily through the party system, elections, etc. or through the formation of a pressure group?

(b) If we want to form a pressure group or any other kind of political organization, what incentives should we offer potential members to get them to participate?

(c) As leaders or initiators of a political organization, what are the important functions we must perform?

This unit marks the end of the theoretical half of the course. Most of the remainder will concentrate on factual descriptions of the American political system.

Objectives. The objectives for this unit are to be able to answer all of the following questions, correctly, completely and thoughtfully and to be aware of where you agree and disagree with each author and why.

Olson

1. Why, does Olson say, is it not rational for an individual firm to try to get a government subsidy for the industry of which it is a part? Can you spot a flaw in his argument?

2. On page 48 Olson summarizes his arguments thusfar. Read that paragraph (and the arguments which it summarizes) carefully. Can you find any flaws in his three conclusions? What are the flaws?

3. Olson talks a lot about providing an "optimal supply of a collective good." What is an "optimal supply"? How does the idea of an optimal supply relate to these collective goods: a tax break, a tariff, a crop subsidy, a new President, and the repeal of a capital punishment?

4. What is a "latent group"? A "priviledged group"? An "intermediate group"?

5. The electorate could be considered a "latent" group; after all, if one member does not help provide the collective good (e.g., a new President) no other one member will be significantly affected and therefore none has any reason to react. If this is so, is it rational for a person to vote? Why?

6. How can it be "rational" for a member of the proletariat not to act to advance his class interests?

7. What were the main tenets of Bentley's "group theory"? What modification did Truman introduce?

8. According to group theory as developed by Bentley and Truman, what forces tend to create a just and desirable balance of group interests?

9. What, does Olson say, is the fundamental flaw in the group theorists' approach? *Most important:* Can you rebut Olson's criticism and "save" group theory—from Olson's attack, at least?

10. Olson says that for the analytical pluralists to be "correct in emphasizing the 'potential' group and belittling the organization, . . . they must show *why* the individual member of the large latent group will voluntarily support the group goal when his support will not in any case be decisive in seeing that the group goal is achieved, and when he would be as likely to get the benefits from the attainment of that goal whether he had to work for its attainment or not." Can you think of reasons why an individual *would* act to support a large voluntary group, even if to do so would be to go against his individual economic interests?

Schattschneider

1. Why does Schattschneider feel that the *scope* of a conflict is so important? Explain fully.

2. Describe the scope and bias of the pressure system.

3. Schattschneider says that the public should choose the battleground that favors its strengths, namely, parties and elections, rather than pressure groups. What kind of critique can you make of this argument?

Frohlich, Oppenheimer and Young

1. What is "strategic interaction"? Why is it important in the formation of organizations to supply collective goods?

2. What is the function of the political leader in the formation of organizations to supply collective goods?

Study Note. It seems most important to understand how and why interest groups are formed and people participate actively in them. Therefore we will not be concerned with Olson's discussions of small, or "priviledged" groups, nor with the details of problems of suboptimal supply. It is sufficient just to know what these terms mean.

Suggested Procedure. Read:

M. Olson, *The Logic of Collective Action*, pp. 1-65, 98-131.
E.E. Schattschneider, *The Semi-Sovereign People*, chs. 2-3.
Frohlich, Oppenheimer and Young, *Political Leadership and Collective Goods*, pp. 3-25.

INTRODUCTION TO THE AMERICAN POLITICAL PROCESS

UNIT 8: CONGRESS

Introduction. An obvious but important part of figuring out how to influence government policy is to find out the details of how policy is made. Laws are passed by Congress—but what kinds of laws? How do they get there, how are they changed, how are they passed or stifled, how are they implemented? This is the traditional lore of basic government courses, but we will try to get some different lights shed on these questions.

Criticism of Congress has been a favorite national pastime for decades. The gist of these gripes has usually been that Congress can't take any action on its own and obstructs the actions of everyone else. The inability of Congress to stop the Vietnam War, or even find out the truth about it, is a recent blatant example.

Obviously, the initiative has passed from the Legislative branch to the President, a development not foreseen (and in fact resisted) by the Founding Fathers. In the previous section we saw how federalism restrains the Supreme Court from the full exercise of its powers. In this section we explore not only the restraining effect of federalism, especially as it affects the risks and incentives under which a Congressman operates, but also the limitations ("checks and balances") placed on their discretion and initiative by the separation-of-powers structure. Though the Congress still retains some initiative (wage-price controls, environmental protection, military contract investigations, the separation of foreign economic aid from military aid, and the prohibition against ground troops in Laos and Cambodia were all Congressional initiatives), on the whole the Congress mainly responds to Presidential proposals and checks up on the Administration's performance.

The constellation of reasons for this loss of initiative may be the relative isolation of the small-town-lawyer-businessman-*cum*-politician who makes up the bulk of the House of Representatives. Samual Huntington has described how their provincial isolation from major nationalizing changes in society, along with the dispersion of power in

Congress, has caused delay and inaction on new problems. This isolation is strongest in the field of foreign affairs, and the distinction between foreign and domestic affairs must be kept constantly in mind. The relative power balance between Congress and the President is noticeably different in the two spheres.

Another possible factor in the great inertia of Congress may be the inherently greater difficulties of coordinating the actions of 538 independent power holders, as compared with the relatively hierarchical structure of the Executive branch. Still another frequently cited factor is the increasing technical complexity of 20th-century legislation and administration, giving an advantage to the permanent career bureaucrats and technical experts in the Executive bureaucracy. This seems to be especially intimidating in the formulation of military policy.

The readings in this unit should help you to begin thinking more systematically about the problems and potentials of Congressional lawmaking. Lockard's chapter 5 recites the standard litany of despair and disgust and will familiarize you with the mainstream of criticism that regularly ebbs and flows from liberals. The chapter on military policy in Truman illustrates the special factors that bear on Congress in its oversight of foreign and military affairs. Saloma develops a systematic normative framework and tries to evaluate Congressional performance on a number of dimensions. The Saloma treatment is more thoughtful and more difficult than the others; it also presents a politive view of Congress in its function of providing alternative avenues of representation. (Study note: You may wish to refer to pp. 37-52 for a full explanation of the models of Executive-Legislative relationships Saloma uses in chapter three.)

Objectives. The objectives for this unit are for you to be able to state clearly where you agree or disagree with each author and why, and to be able to answer the following questions accurately and thoughtfully:

Lockard:

1. Why has Congress lost so much initiative to the Executive and Judicial branches? (Include both Lockard's suggested reasons and your own judgments.)

2. Lockard accuses the Congress of perverting national priorities by its responsiveness to money, organized power, and vested interests. What evidence and arguments does he use to support this accusation? Are you convinced? What counterarguments could you cite in defense of Congress?

3. "Prevalent and paranoiac fear of majority rule" is Lockard's picture of power in Congress. What are the formal and informal rules which distribute power to small groups and individuals? (Lockard cites at least six.)

4. Is Congress' excuse of fear of the "tyranny of the majority" acceptable? After all, wouldn't *you* want to be able to stop Congress from passing legislation which would severely damage your interests—particularly if there were no clear national majority actively in favor of the proposed legislation?

5. a. What is "cloture"? How can it be invoked?
   b. What is "Calendar Wednesday"? "Unanimous consent"? How do these devices affect the pace of legislation?
   c. What does the Rules Committee do "officially"?
   d. What does it do "unofficially"?
   e. What does a "discharge petition" do? Who must sign it?

6. What definition of "representative" does Lockard seem to prefer? What are the functions of the representative? (Include Lockard's version, and specify your own modifications.;

7. The "intensity problem" keeps appearing in discussions of democratic theory. Briefly, what's the problem?

Truman:

1. According to the Carroll chapter (and most other observers) Congress mainly defers to Executive "expertise" in national military policy, providing mostly ritual legitimation to the President's definition of national interest and to the military experts. List and describe at least four of the factors that Carroll identifies as leading to Congressional restraint in military policy.

2. On February 7, 1972, President Nixon signed into law the Foreign Assistance Act of 1971. Section 301 of that Act reads in part:

"No assistance shall be furnished under this Act, and no sales shall be made under the Foreign Military Sales Act, to Greece. This restriction may be waived when the President finds that overriding requirements of the national security of the United States justify such a waiver and promptly reports such finding to the Congress in writing, together with his reasons for such finding."

Just ten days later, Nixon issued an Executive Order authorizing $70,000,000 worth of military aid to Greece, at the same time sending his written reasons to Congress for his action. When he did this, Rep. Benjamin Rosenthal (D-Queens, N.Y.), chairman of the House Foreign Affairs subcommittee whose hearings produced the ban on aid to Greece, said, "This decision affirms in my mind the impotency of Congress."

Is Rosenthal right or wrong, in your opinion? Why?

Saloma:

1. Saloma discusses several ways in which the majority represented by Congress differs from the President's majority. (Remember Dahl's discussion of majority rule?) Select the four distinctions which seem most important to you and describe them in some detail.

2. In chapter 3 Saloma writes about four popular but inaccurate stereotypes about Congress. Summarize the stereotypes and the evidence he gives which rebut them.

3. What is a "committee veto"? Do you think it is unconstitutional? Why?

4. What is the difference between and relationship between authorization and appropriation? Who does which?

5. It might help to clarify Saloma's evaluation scheme if you draw up a 4x8 table with columns for the criteria and rows for the models; then fill in the cells with his (or your own) judgments. Using this framework, compare the Presidential/responsible party model (as represented by Burnham and Broder in Unit 4) with the Constitutional balance model (as represented by Saloma's emphasis on dual representation). Toward which model would you like to see the government reform itself? Why?

6. "Administrative oversight" is an increasingly important function of Congress, but, as Saloma remarks, it is too often forgotten by the public and by Congress' critics. What does the phrase mean? Name a few recent examples of administrative oversight found in Saloma. What more recent examples can you think of?

7. For several years there seems to have been a majority in the Senate in favor of withdrawal from Vietnam. Describe as many legislative control techniques which a determined majority might have used to implement this consensus.

Procedure. Read:

Lockard, ch. 5

David Truman, *Congress and America's Future*, pp. 1-4, 150-183
John Saloma, *Congress and the New Politics*, chs. 3-5

A Bibliography on PSI
and
Political Science Papers
on PSI

Part I

A Selected Bibliography of Publications on PSI: the Method of Instruction and Applications in the Social Sciences*

BORN, DAVID G. *Instructor Manual for Development of a Personalized Course.*

KELLER, F.S. and SHERMAN J.G. *The Keller Plan Handbook: Essay on a Personalized System of Instruction.* W.A. Benjamin Co., Menlo Park, California, 1975.

RUSKIN, R.S. *The Personalized System of Instruction: An Alternative.* ERIC/The American Association of Higher Education. Monograph #5. 1 Dupont Circle, Washington, D.C. 1974.

RYAN, B.A. PSI, *Keller's Personalized System of Instruction: An Appraisal.* The American Psychological Association, Washington, D.C. 1974.

SHERMAN, J.G. editor, *Personalized System of Instruction: 41 Germinal Papers.* W.A. Benjamin Inc., Menlo Park, California 1974.

ASSMAN, J. *PSI and its challenge to education.* California State College, Dominquez Hills. Paper presented at the West Coast PSI Conference.

BILLINGS, D.B. *PSI versus the lecture course in the principles of economics: A Quasi-controlled experiment.* Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974.

BLACKBURN, T., & SEMB, G. *The comparative effects of self-grading versus proctor-grading of tests on student performance in a personalized instruction course.* Paper presented at the Conference on Behavior Research and Technology in Higher Education.

BORN, D., DAVIS, M. WHELAN, P., & JACKSON, D. "College student study behavior in a personalized instruction course and in a lecture course," in G. Semb, ed., *Behavior Analysis and Education,* 1972.

BORN, D. *Exam performance and study behavior as a function of study unit size in a PSI course.* Paper presented at the Conference on Behavior Research and Technology in Higher Education.

BORN, D., GLEDHILL, S. & DAVIS, M. Examination performance in lecture-discussion and personalized instruction courses. *Journal of Applied Behavior Analysis,* 1972, 5, (1), 33-43.

BORN, D., & HERBER, E. "A further study of personalized instruction in large university classes." *Journal of Experimental Education,* 1971 40 6-11/

BORN, D., & ZLUTNICK, S. "Personalized Instruction." *Educational Technology,* 1972, 7(4).

BORN, D., & WHELAN, P. "Some descriptive characteristics of student performances in PSI and lecture courses." *The Psychological Record,* 1973, 23, 145-152.

* Selections are based upon the bibliography prepared for distribution by the Center for Personalized Instruction, Georgetown University, *The Personalized System of Instruction in Higher Education: An Annotated Review of the Literature,* Robert S. Ruskin and John H. Hess, 1974.

BRELAND, S. & SMITH, O. *A comparison of PSI and traditional methods of instruction for teaching introduction to psychology*. Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974.

CALHOUN, J.E. *Self-pacing and student performance in a PSI course*. Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974.

CALHOUN, J.F. *Elemental analysis of the Keller Method of instruction*. State University of New York, Stony Brook. Paper presented at the annual meeting of the American Psychological Association, 1973.

COLDEWAY, D.O. & SCHILLER, W.J. *Training for the personalized system of instruction*. Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974.

CROFT, R., & JOHNSON, W.G. *A PSI course in personality: Relative effectiveness and the influence of monitoring on student performance*. Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974.

EDWARDS, K.A., & POWERS, R.B. Self-pacing in a personalized system of instruction: work patterns and course completion. Utah State University. Paper presented at the National Convention of the Association for Educational Communications & Technology, 1973 *Journal of Experimental Education*, in press.

FARMER, J., LACHTER, G. BLAUSTEIN, J.J., & COLE, B.K. "The role of proctoring in personalized instruction." *Journal of Applied Behavior Analysis*, 1972, 5, 401-404.

FERSTER, C.B. "Individualized instruction in large introductory psychology course." *Psychological Record*, 1968, 18, 521-532.

GOMEZ-JUNCO, H. *Some considerations concerning the large scale application of the personalized system of instruction in an institution of higher learning*. Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974.

KULIK, J.A., KULIK, C., & CARMICHAEL, K. "The Keller Plan in science teaching," *Science*, 1974, 83, 379-383.

KULIK, J.A., KULIK, C.L. & MILHOLLAND, J.E. *Evaluation of an individualized course in psychological statistics*. Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974.

LLOYD, K.E., & KNUTZEN, L.J. "A self-paced programmed undergraduate course in the experimental analysis of behavior." *Journal of Applied Behavior Analysis*, 1969, 2, 125-133.

LOCKSLEY, N. *To PSI or not to PSI? That is the cost-effectiveness question*. Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974.

LUDWIG, M., & MANDRYK, T.F. *Does criterion mastery approach "equality" in student learning*: Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974.

MAILLE, G.A. *A pilot study concerning the effects of the personalized system of instruction on self-actualization*. Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974.

MORRIS, C., & KINBRILL, G. McA. "Performance and attitudinal effects of the Keller Method in an introductory psychology course." *Psychological Record,* 1972, 22, 523-530.

MYERS, E.A. "Operant learning principles applied to teaching introductory statistics," *Journal of Applied Behavior Analysis,* 1970, 3, 191-198.

NELSON, T.F., & SCOTT, D.W. "Personalized instruction in educational psychology." *Michigan Academician,* 1972, 4, (3).

NELSON, T.F., & BENNETT, M. "Unit size and progress rates in self-paced instruction." *Journal of College Science Teaching,* 1973, 3, 2.

NEWTON, J.M. *PSI enlightens the "dismal science".* University of Oregon. Paper presented at the West Coast PSI Conference.

POWERS, R.B., EDWARDS, K.A. & HOEHLE, W. "An adjusting reinforcement schedule facilitates exam-taking in self-paced courses" *Psychological Record,* 1973.

RUSHTON, J.B. *Formulating the successful proposal for PSI course-Development funds.* Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974.

SEMB, G. *Effects of grading criteria and assignment length on student test performance in a personalized instruction course.* University of Kansas. Paper presented at the annual meeting of the American Psychological Association, 1973.

SEMB, G. "Personalized instruction: The effects of mastery criteria and assignment length on college student test performance." *Journal of Applied Behavior Analysis,* 1973, in press.

SHEPPARD, W.C., MACDERMOTT, H.G. "Design and evaluation of a programmed course in introductory psychology." *Journal of Applied Behavior Analysis,* 1970, 3, 5-11.

SHUPE, D.V., & MEEKER, F.B. *Comparative study of PSI vs. conventional introductory psychology.* California State Polytechnic University, Pomona. Paper presented at the West Coast PSI Conference.

TOSTI, D.T. "The peer-proctor in individualized programs". *Educational Technology.* August, 1973.

WARNANCH, H.R. LAZAR, R. SOARES, C., & TERMAN, M. *"Fading in" the PSI mastery quiz: A key to the problems of procrastination and repeated failures.* Paper presented at the National Conference on Personalized Instruction in Higher Education, 1974

Part II
Papers on PSI presented at Political Science meetings

JAMES L. BARTH, WILLIAM T. McCLURE, JR., DAVID L. CARLSON, RICHARD D. CHRISTOFFERSON, PAUL G. CONWAY, FRANK J. COOK, LARRY D. WILLIS, "Systems Analysis in the Introductory American Government Course: The Audio-Tutorial Technique," A report and panel discussion prepared for the Annual Meeting of the American Political Science Association, New York, September 2-6, 1969.

JOHN ELLSWORTH, "Personalized Systems of Instruction," Paper prepared for the Annual Meeting of the American Political Science Association, Chicago, August 29—September 2, 1974.

THEODORE B. FLEMING JR., "Automation and Personalization: A Program for Beginning Courses," Manuscript received by DEA.

THEODORE B. FLEMING JR., "Personalization and the Large Lecture Section," *Teaching Political Science*, I (October 1973), pp. 89-93.

RONALD C. GREEN, "Mentrex: An Experiment in Teaching American Government," *Teaching Political Science*, I (April 1974), pp. 225-236.

SUSAN HOBART, "Small Group Peer Instruction in the Introductory Course," Paper prepared for the Annual Meeting of the Western Political Science Association, Denver, April 4-6, 1974.

WILLARD B. STOUFFER, GEORGE M. WEINBERGER, AND RONALD M. RENFRO, "The Keller Method, A Possible Solution to the Service Course Problem," Paper prepared for the Annual Meeting of the Western Political Science Association, Denver, April 4-6, 1974.

WILLARD B. STOUFFER, GEORGE M. WEINBERGER AND RONALD M. RENFRO, "The Keller Method in Political Science," Paper prepared for the Annual Meeting of the Midwestern Political Science Association, Chicago, April 27-29, 1974.

PATRICIA TAYLOR, "Personalized Instruction: The Introductory Political Science Course." Paper prepared for the Annual Meeting of the American Political Science Association, New Orleans, September 4-8, 1973.

NEUMAN F. POLLACK, "The Personalized System of Instruction in Political Science," Workshop on Individualizing Instruction in the Humanities and Social Sciences, Co-sponsored by the Southern Regional Education Board, the American Studies Association, and the University of Tennessee, at Knoxville, Tennessee. (February 13-15, 1975)